ENGINEERING NEWS-RECORD

MAY 26, 1949

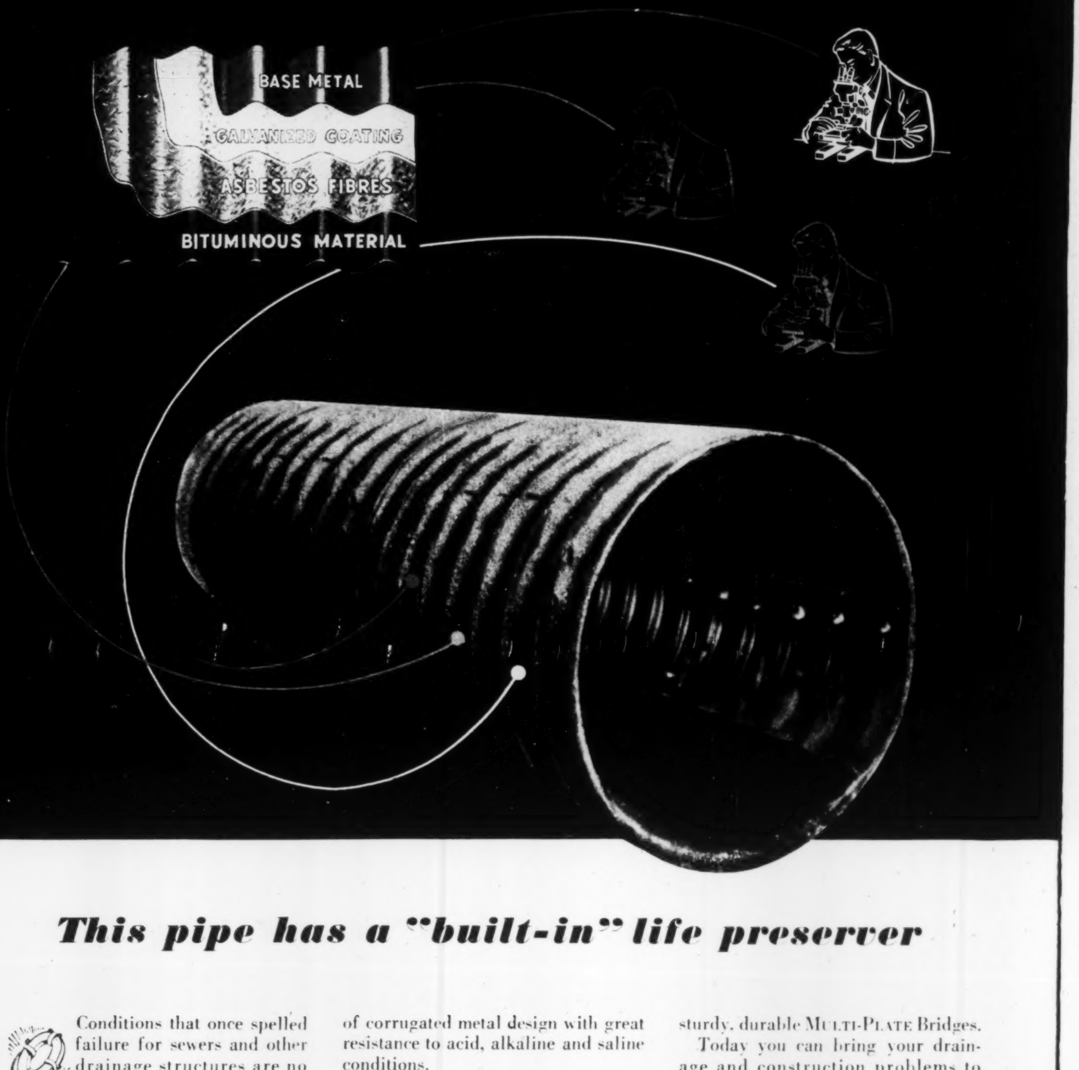
Variation of chemical dosage is easy in this new Phoenix, Ariz., water plant

DO MULTI-PURPOSE RESERVOIRS AID WATER QUALITY?

• • •

N. Y. PILE CODE RECOGNIZES LOAD-TEST CRITERIA

A McGRAW-HILL PUBLICATION



This pipe has a "built-in" life preserver

Conditions that once spelled failure for sewers and other drainage structures are no longer a worry. ARMCO Engineers were determined to develop a pipe that would take severe corrosion in stride and provide long, economical service life.

They did it by applying a rot-proof and non-deteriorating coating of asbestos. This inert mineral product is inseparably bonded to the pipe. As the sheet metal emerges from the galvanizing unit millions of asbestos fibres are partly embedded in the zinc before it hardens. Then the fibres are thoroughly impregnated with a special saturant and seal coat. When the sheets are corrugated and formed they become ARMCO ASBESTOS-BONDED Pipe—a new kind of drainage structure combining the proved strength of corrugated metal design with great resistance to acid, alkaline and saline conditions.

Creating better products to meet specific needs has been the objective at Armco for more than 40 years. A few examples are HEL-COR Perforated Pipe, STEELOX Buildings, FLEX-BEAM Guardrail, PIPE-ARCH, and sturdy, durable MULTI-PLATE Bridges.

Today you can bring your drainage and construction problems to Armco with full assurance you will receive all the benefits of long experience, extensive research facilities, and a real interest in helping you solve your most difficult problems.

Armco has a complete range of engineered products and convenient, authoritative data to help you. If your problem is unusual, why not talk it over with our engineers?

ARMCO DRAINAGE & METAL PRODUCTS, INC.

MIDDLETOWN, OHIO • OFFICES AND PLANTS IN PRINCIPAL CITIES

**Structural Plate Pipe and Arches ★ Corrugated Metal Pipe ★ Welded Steel Pipe
FLEX-BEAM Guardrail ★ Water Control Gates ★ Retaining Walls ★ STEELOX Buildings
Sheeting ★ Tunnel Liner ★ Subdrainage Pipe ★ End Sections ★ Pipe Piling and Pile Shells**

Research keeps
BFG
FIRST IN RUBBER

B. F. Goodrich announces new all-nylon tire

Now B. F. Goodrich announces an all-nylon tire for off-the-road service. Again B. F. Goodrich is first with a money-saving development.

Nylon is extra strong and elastic. Size for size, nylon cord is twice as strong as other cord. Since the new BFG nylon tires have the same number of plies as other tires, you can see that cord body strength is greatly increased. These tires have over twice the bruise resistance and many times the flex life of other cord tires.

The new nylon tires (with the tread design shown above) have been tested on some of the toughest operations in the country. In all of the tests, *not a single tire blew out and not one flex break occurred!*

Even with nylon cord B. F. Goodrich uses weftless construction. This means there are no cross-threads; cord tension is controlled and equalized. Tire growth is reduced; tires last longer.

Nylon tires will provide big savings to users on dirt-moving projects, quarry, strip-mining and other operations where heavy loads and rough terrain have made tire costs high.

The new all-nylon construction is typical of the continuous improvements being made in truck tires by B. F. Goodrich. Long ago, BFG engineers developed special types of tires for off-the-road service. They constantly developed new improvements. One of these was the nylon shock shield, a major construction advancement now used in all B. F. Goodrich truck tires with 8 or more plies (double nylon shock shield in large off-the-road tires)—including the new all-nylon tire.

For more information on how B. F. Goodrich nylon tires can do more work for you and save you money, see the BFG dealer or write us direct. Quantities available are limited. *The B. F. Goodrich Company, Akron, Ohio.*

Truck Tires BY
B. F. Goodrich

6 hours' work done in 45 minutes

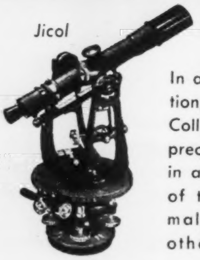
ANYONE CAN USE THE

BERGER

JIG COLLIMATOR

famous for

ACCURACY IN ACTION



Jicol

In actual production, the Berger Jig Collimator enables precision alignment in a small fraction of the time normally taken by other methods.

WHEREVER THERE IS NEED FOR PRECISE ALIGNMENT

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ENGINEERING NEWS-RECORD

VOLUME 142 MAY 26, 1949 NO. 21

WALDO G. BOWMAN
Editor

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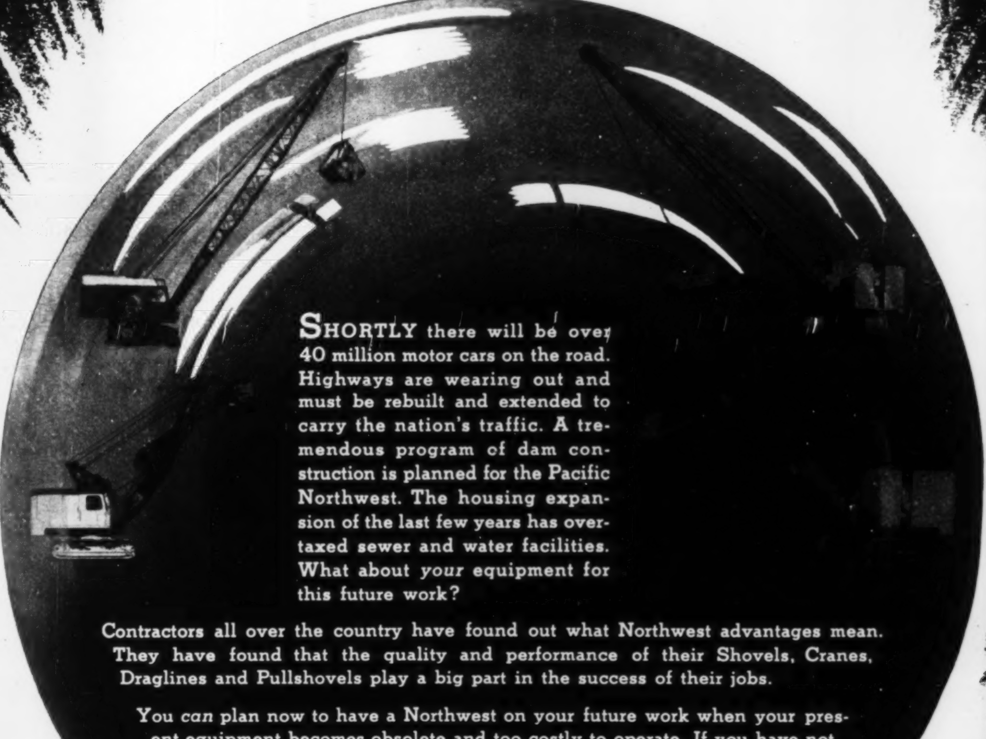

What about YOUR equipment for the Future?

SHORTLY there will be over 40 million motor cars on the road. Highways are wearing out and must be rebuilt and extended to carry the nation's traffic. A tremendous program of dam construction is planned for the Pacific Northwest. The housing expansion of the last few years has overtaxed sewer and water facilities. What about *your* equipment for this future work?

Contractors all over the country have found out what Northwest advantages mean. They have found that the quality and performance of their Shovels, Cranes, Draglines and Pullshovels play a big part in the success of their jobs.

You *can* plan now to have a Northwest on your future work when your present equipment becomes obsolete and too costly to operate. If you have not been a Northwest user remember that one out of every three Northwests sold is a repeat order with a satisfied user. Why not get the same service Northwest users are getting? It will pay you to order a Northwest so you will be sure to get a real Rock Shovel.

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only the best for the heart of the job
MAKE YOUR KEY MACHINE A REAL ROCK SHOVEL
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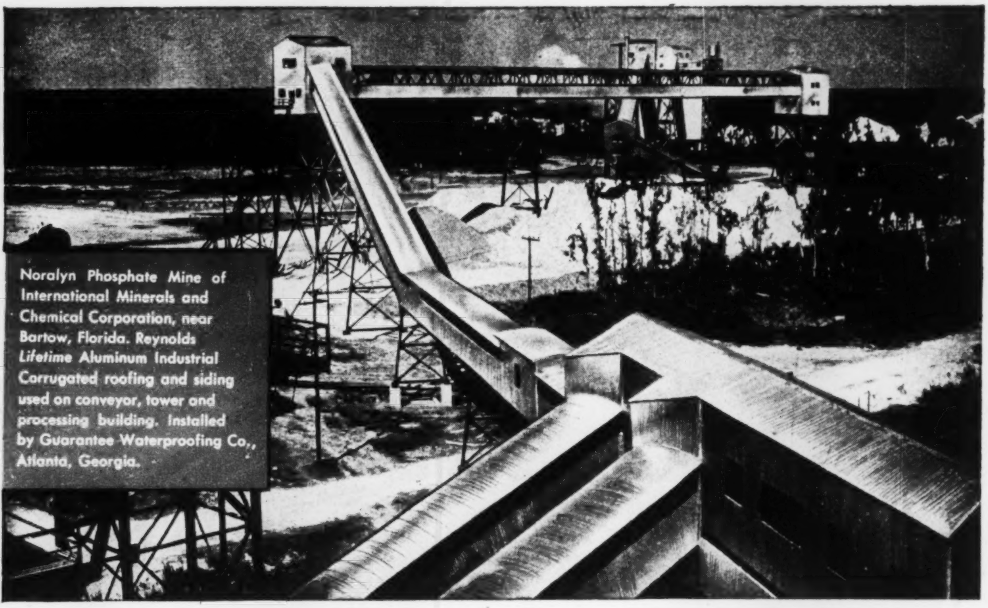
CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



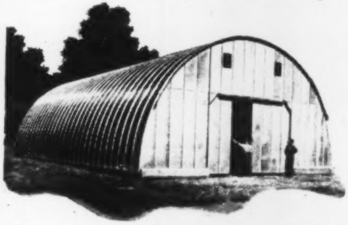
Noralyn Phosphate Mine of International Minerals and Chemical Corporation, near Bartow, Florida. Reynolds *Lifetime* Aluminum Industrial Corrugated roofing and siding used on conveyor, tower and processing building. Installed by Guarantee Waterproofing Co., Atlanta, Georgia.

FLORIDA'S LARGEST PHOSPHATE MINE USES REYNOLDS *Lifetime* ALUMINUM INDUSTRIAL CORRUGATED

"ALUMINUM makes the best roofing and siding," says International Minerals and Chemical Corporation.

Reynolds .032" thick, extra-deep Corrugated has exceptional strength, is rust-proof and corrosion-resistant. Protective painting not necessary. Maintenance practically nil. In addition, aluminum's radiant heat reflectivity keeps interiors cooler in summer, more economical to heat in winter. Easy to apply over any purlin. Reynolds also manufactures all accessories for complete installations.

Reynolds engineers will gladly work with you on any new construction or building repair problems. Call on them. **Reynolds Metals Company,** Building Products Division, Louisville 1, Ky. Offices in 32 principal cities.



REYNOLDS "ALUMI-DROME" all-purpose prefab!

All aluminum. Patented all-bolt construction. Basic unit 36′ x 60′, length variable by 6′ sections. Wide choice of door and window arrangements.

IF YOU SEE RUST YOU KNOW IT'S NOT ALUMINUM

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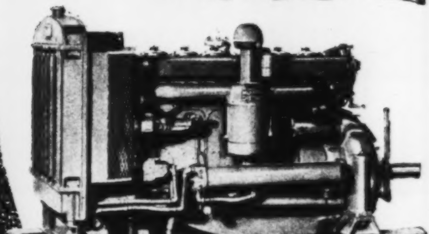
- ☐ Reynolds Alumi-Drome

Company ____________________

Address ____________________

Your Name & Title ____________________

Profit by Lafayette County's experience!



Murphy Diesel Engines and Power Units are available in sizes from 90 to 190 H.P.; Generating Sets from 60 to 116 K.W. All models are "True" Diesel Engines featuring the famous Murphy Unit Injector. Ask your Murphy Diesel Dealer for full details or write direct.

2000 Tons of Crushed Rock Per Day on 66 Gallons of Fuel . . .

Lafayette County, Wisconsin, is proving daily that the best equipment pays for itself in reduced operating costs. The crushing plant illustrated above, for example, with a 90 H.P. (Cont.) Murphy Diesel on the primary and a 135 H.P. (Cont.) Murphy Diesel on the secondary, produces 900 cu. yds. of 1" material and 725 cu. yds. of ¾" material—a total of over 2000 tons—per nine hour day on only 66 gals. of economical diesel fuel!

Mr. Geo. E. Alderson, Commissioner of Lafayette County, says of the set-up, *"We are sure glad we have the two Murphys on our crushing plant and I can say you make no mistake when you use Murphy Diesels . . . I am sold on the set-up all the way through."*

MURPHY DIESEL COMPANY
5311 W. Burnham St., Milwaukee 14, Wisconsin

MURPHY DIESEL

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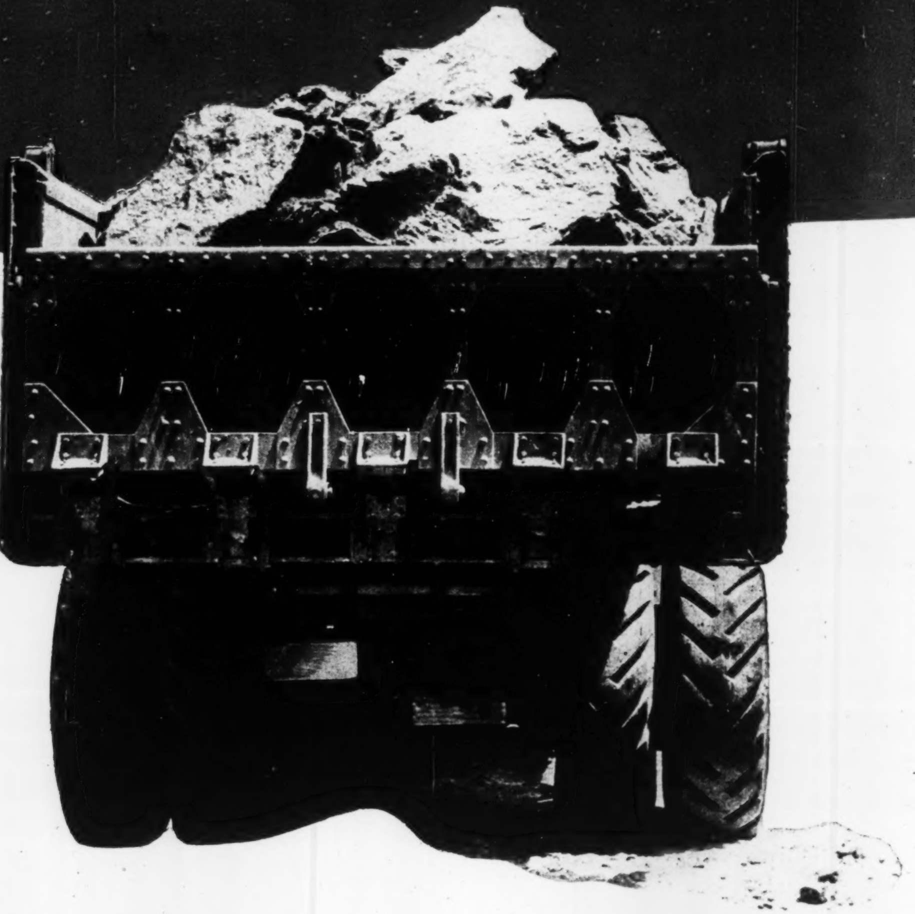


MORE THAN 300 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD!

Tune in . . .
TEXACO STAR THEATRE
presents MILTON BERLE
every Wednesday night.
See newspaper for
time and station.

TEXACO

LAST LONGER

AND maintenance costs come down when you lubricate with long-lasting Texaco Marfak.

HIT IT! *Marfak* won't splatter like ordinary chassis grease—proof that it stays in the bearings under heavy loads and pounding service.

Heavy loads won't squeeze *Texaco Marfak* out of bearings. Rough service won't jar it out. *Texaco Marfak* seals out dirt and road splash, keeps rust-forming moisture off metal. Bearings get full protection, parts last longer, maintenance costs less.

In wheel bearings, *Texaco Marfak Heavy Duty* is the stay-on-the-job lubricant to use. It seals itself in, seals out dirt, protects against rust. It won't leak onto brakes . . . requires no seasonal re-packing. *Texaco Marfak Heavy Duty* will save you many a wheel bearing replacement . . . sharply reduce your maintenance costs.

The line-up of Texaco lubricants for contractors' equipment also includes *Texaco Ursa Oil X***, designed to keep Diesel and heavy-duty gasoline engines clean . . . and *Texaco Track Roll Lubricant* to give rollers extra protection against dirt and moisture.

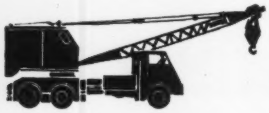
Use Texaco's Simplified Lubrication Plan to get better, more economical performance from *all* your equipment. A Texaco Lubrication Engineer will gladly tell you about it. Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.

STRETCH IT! *Marfak* holds together where ordinary grease comes apart—proof that it can't work out of bearings, gives longer-lasting protection.

RUB IT! See how *Marfak* liquefies under friction while retaining its tough outer "collar"—proof that it seals itself in, seals out dirt and moisture.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

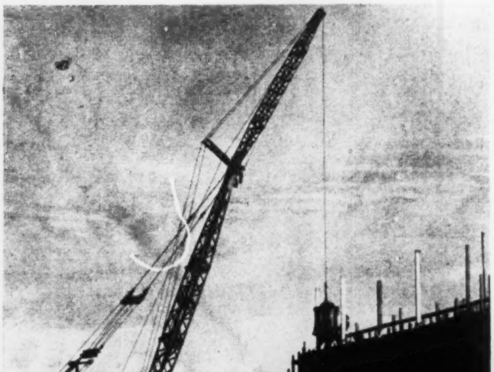


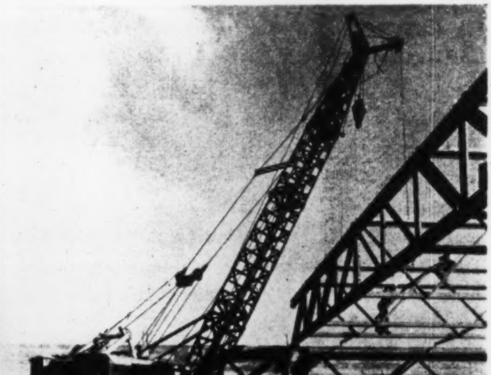
BAY CITY CRANEMOBILE

handles a variety of jobs . . . *quickly!*

Whether handling concrete or setting steel, a BAY CITY CraneMobile is a versatile machine on any construction job. At the left, a model 180 CraneMobile with 20-ton capacity, is speeding form pouring for Schmidt Bros., of Long Beach, California, while at the right, the Model 150 CraneMobile having 10-ton capacity is setting steel quickly and easily on a Florida job for Dickinson Steel Erecting. Big capacity, long booms and jibs and plenty of power . . . CraneMobile handles ANY job in less time.

Operators like the BAY CITY quick responsive swing and booster type clutches that mean smooth, positive operation at all times. Sound engineering plus rugged construction means steady day-in, day-out high performance without costly "down-time" for repairs. From every angle CraneMobile is a better buy. Write, wire, or phone for facts today.





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SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

BAY CITY SHOVELS INC., BAY CITY, MICHIGAN See your nearest Bay City dealer for excavating and material handling equipment in sizes from ⅜ to 1¼ yard with crane rating up to 20 tons. Both crawler and pneumatic tire mountings.

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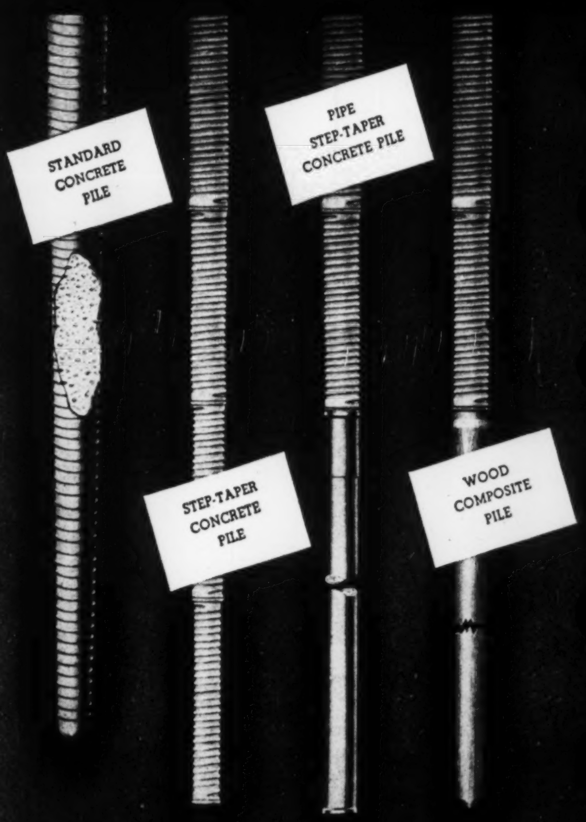

Raymond's successful experience for more than a half century has thoroughly proved these six outstanding advantages of Raymond Concrete Piles. These benefits, plus Raymond's expert personnel and specialized equipment, result in sound, dependable substructures that meet every requirement. You are invited to consult our engineers for the facts.

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Every Raymond Concrete Pile is a permanent achievement, accomplished by a series of carefully planned steps which assure a safe subsurface support.

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The use of rugged equipment and heavy hammers permits driving to high carrying capacities, and the soil pressures developed during driving are fully understood.

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Regardless of variations in subsoil conditions, Raymond piles can be driven to any depth required to obtain uniform bearing capacity [illegible]

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5 [illegible]

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By the satisfactory completion of over 10,000 contracts, involving more than 25 million feet of piling, Raymond has established a world-wide record of achievement.

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52 YEARS FOUNDED 1897 OF PROGRESS

THE SCOPE OF RAYMOND'S ACTIVITIES

Includes every recognized type of pile foundation—concrete, composite, precast, steel, pipe and wood. Also caissons, underpinning, construction involving shore protection, shipbuilding facilities, harbor and river improvements and borings for soil investigation.

You can get delivery
CAST IRON
CAST IRON
CAST IRON
CAST IRON
CAST IRON PIPE

sooner than you think

Cast iron pipe is more readily available today than a year ago. You can get it sooner than you think. And here's why.

The cast iron pipe industry, in spite of raw material shortages, achieved in 1946, 1947 and 1948, the greatest three-year production program in its history. Those were the years of urgent demand for cast iron pipe created, to a large extent, by construction to meet a national housing emergency.

For 1949, the increased rate of production is expected to continue and therefore:

You can get cast iron pipe sooner than you think!

Cast Iron Pipe Research Association, Thomas F. Wolfe, Engineer, 122 South Michigan Avenue, Chicago 3, Illinois.

96% OF ALL 6-INCH AND LARGER CAST IRON WATER MAINS EVER LAID IN 25 REPRESENTATIVE CITIES ARE STILL IN SERVICE.

[illegible]

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USE ONE HAND OR BOTH!

SKIL Saw

is easier to operate in any position!

Quick, one-hand operation on ordinary cuts.

Safe, sure control using both hands on all difficult cuts.

With SKIL Saw you make any cut in the way that's most convenient for you. On all ordinary cuts, SKIL Saw's perfect balance assures easy, one-hand operation with the rear handle. On overhead or other unusual cuts you get the safe, sure control of SKIL Saw's scientifically placed *extra* handle.

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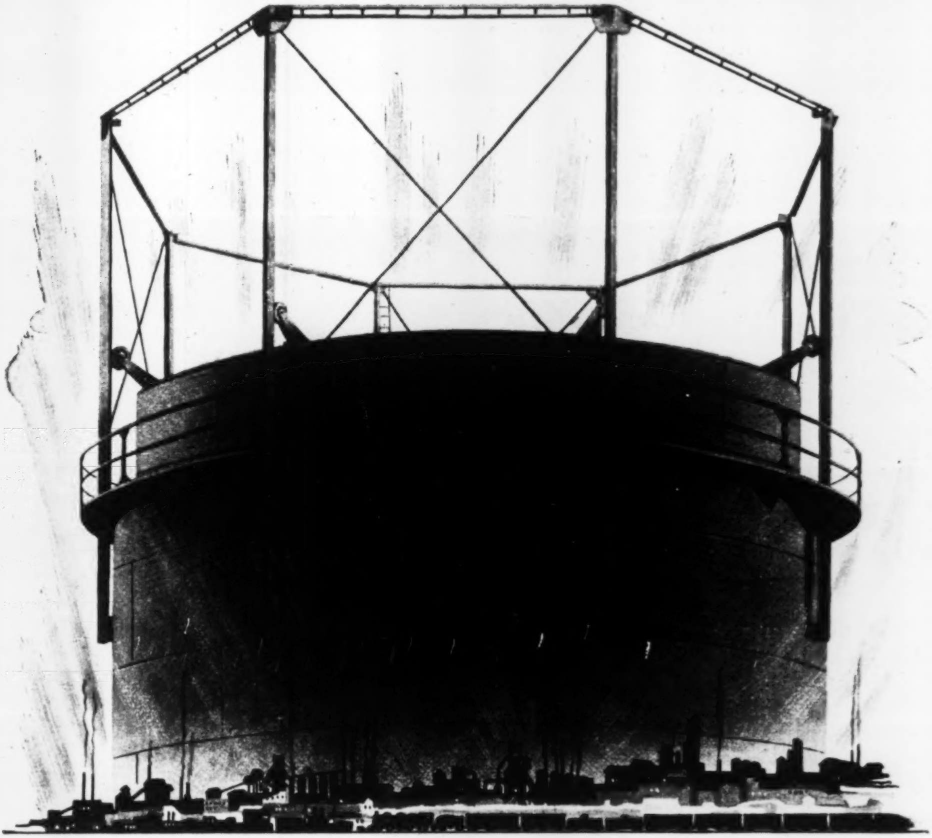

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• For over forty years the Chattanooga Boiler and Tank Company has produced storage tanks and allied structural equipment for chemical and other processing industries.

During this time, each installation . . . the product of engineering ingenuity, skilled fabrication and erection efficiency . . . has served our valued customers safely, dependably and economically.

Behind the completed work of every assignment undertaken by the Chattanooga Boiler and Tank Company is the assurance of industrial integrity, the cornerstone of all our operations.

CHATTANOOGA BOILER and TANK CO.

Chattanooga, Tenn.

STEEL
SOUTHLAND
PRODUCTS

OVER 40 YEARS OF SERVICE TO AMERICAN INDUSTRY

Standardize and

STANDARDIZED EQUIPMENT

Two "matched teams" of "Caterpillar" DW10 Tractors and W10 Wagons working on well-timed schedule with a "Caterpillar" Diesel-powered shovel on the Cincinnati Freeway project.

"MONEY saved is money made" is an old saying that makes a lot of sense. Shrewd contractors make it one of their most valuable guides to profit. The DeSalvo Construction Co., of Cincinnati, is one of them.

Says A. DeSalvo, Vice-President: "We learned the hard way—through experience with jumbled equipment that was often expensive. But today WE'RE NOT GUESSING when considering our requirements for important earthmoving projects. We've found that all-'Caterpillar' equipment — made entirely by one high-caliber manufacturer and serviced by one thoroughly equipped dealer — offers the surest means for saving and making money.

"It eliminates confusion. It simplifies maintenance — gets us efficient service quickly when we need it. It makes operators more familiar with their machines, and consequently more expert. It definitely contributes to the continuous operation that is so essential to high production and low costs.

"On the Freeway job our fleet of 'Caterpillar' machines gave us very high availability time per hour. They plainly showed that they are specially designed to work together; and their performance in every way justifies our continued confidence in 'Caterpillar.' "

"Standardize and economize" — real buy words for "Caterpillar" Diesel equipment!

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR
REG. U. S. PAT. OFF.
DIESEL

ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

Economize

STANDARDIZED SERVICE—Headquarters of the "Caterpillar" dealer whose modern facilities and factory-trained mechanics enabled the DeSalvo Company's "Caterpillar" equipment to keep its job on the Cincinnati Freeway project moving.

STANDARDIZED EQUIPMENT

A "matched team": A "Caterpillar" D8 Tractor and No. 80 Scraper making medium-haul cuts and fills on the Cincinnati Freeway.

STANDARDIZED EQUIPMENT

Two "matched teams": A "Caterpillar" D8 Tractor and No. 8S Bulldozer and a DW10 and W10 Wagon collaborating on hauling-and-spreading on the Cincinnati Freeway.

STANDARDIZED EQUIPMENT

A "Caterpillar" No. 12 Motor Grader maintaining road for "Caterpillar" earthmoving equipment . . . another example of "matched team" work on the Cincinnati Freeway project.

CUT FUEL COSTS IN HALF

with the SCHRAMM *Pneumastat*

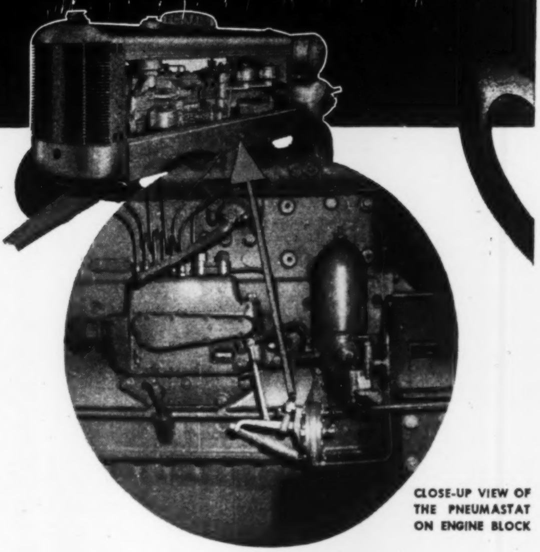
YES, this saving is now possible with the new feature of the Schramm Air Compressor . . . the Pneumastat!

The Pneumastat assures you of *infinitely variable speed* and the elimination of continuous loading and unloading. The result is an *even flow of air* regardless of how variable the compressor load might be!

Other advantages offered by the Pneumastat are:

- ✓ Higher average working pressure—more work from your tools.
- ✓ Simple and rugged . . . no valves, no checks, no pistons.
- ✓ Longer compressor and engine life.
- ✓ Lower maintenance costs.
- ✓ Requires no service or adjustment.

COMPLETE DETAILS ON REQUEST, WRITE DEPT. AOW.



CLOSE-UP VIEW OF THE PNEUMASTAT ON ENGINE BLOCK

SCHRAMM INC.

THE COMPRESSOR PEOPLE . WEST CHESTER . PENNSYLVANIA

FOR ECONOMICAL

Water Storage

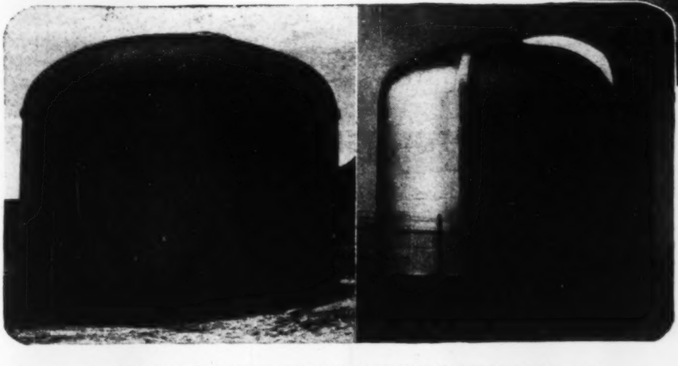
AT NATURAL ELEVATIONS

PITTSBURGH·DES MO

Standpipes

and

Reservoirs



Sound, enduring performance, based on correct engineering, dependable fabrication and careful erection, assures complete satisfaction with Pittsburgh-Des Moines Steel Standpipes and Reservoirs.

Over the years, their first-cost economy, low maintenance, and continued freedom from deterioration make these units an ideal water storage investment. *Write!*

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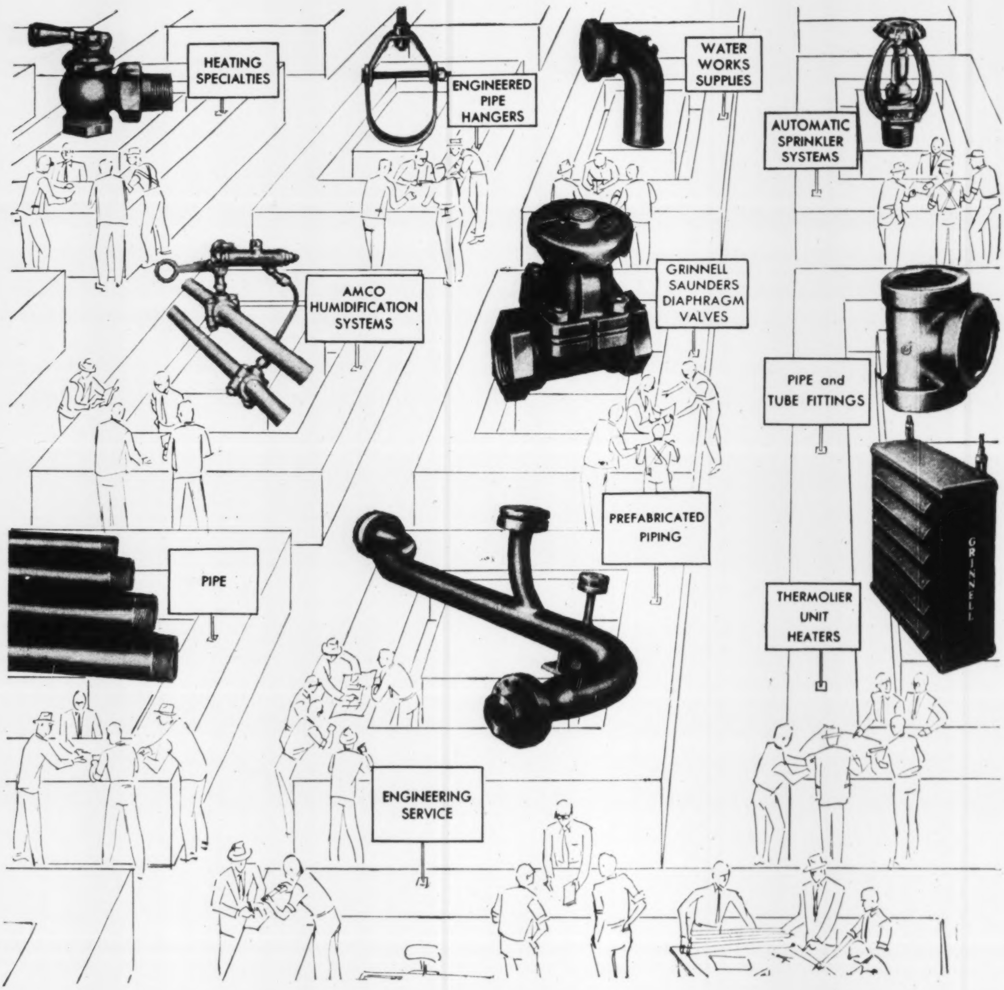
SANTA CLARA, CAL. . 621 Alviso Road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A NEW Link for Old Lyme and Old Saybrook

View showing bridge from Old Saybrook side of river. The deck plate girder, highway span, 2448′ long, is a continuous type structure whose over-water spans were erected without falsework. The seven river spans are 240′ long. The longest continuous girder is 950′.

Over 6000 tons of structural steel went into this bridge which carries two 24′ roadways, separated by 4′ center mall and flanked by two 3′ sidewalks. U·S·S I-Beam-Lok was used for the gutters, center mall and (concrete filled) sidewalks. (Old bridge with bascule span which new bridge replaces shown at left.)

Progress photo showing American Bridge crews erecting 98-ton girders by use of traveling derrick and derrick boat.

Designed by: Connecticut State Highway Department.

Consultants to Bridge Commission:

Howard, Needles, Tammen & Bergendoff

FABRICATED AND ERECTED BY AMERICAN BRIDGE

THE Raymond E. Baldwin Bridge provides an important link carrying U. S. 1 over the Connecticut River between Old Lyme and Old Saybrook, Conn.

The superstructure for this monumental $6,500,000 bridge was fabricated and erected for the State of Connecticut by American Bridge Company. In addition, American Bridge furnished the concrete roadways, sidewalks, gutters and center mall.

Across the country, projects such as this have helped to establish the fact that for "jobs well done" you can depend on American Bridge personnel . . . American Bridge facilities . . . American Bridge experience.

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UNITED STATES STEEL

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CONCRETE PIPE

For more than one hundred years sanitary sewers of concrete pipe have served American cities and have established enviable records for dependability, durability, safety and economy.

Whether you plan a large-diameter combination storm and sanitary sewer such as the 60-in. Borden Trunk Sewer, pictured above, in Vancouver, British Columbia, or a smaller sanitary sewer for domestic wastes, you will find that concrete pipe fully meets every requirement.

Concrete pipe's great strength enables it to resist severe impact and to sustain heavy overburdens. Its smooth interior finish assures maximum hydraulic capacity and resistance to abrasion. Its safety factor is high due to its uniformly dense structure and joints that can be made watertight, thus assuring minimum infiltration and leakage.

The unusual durability of concrete pipe enables it to render many years of heavy-duty sewer service. Best of all, it is economical because its first-cost is moderate, its life extra long and its maintenance costs very low.

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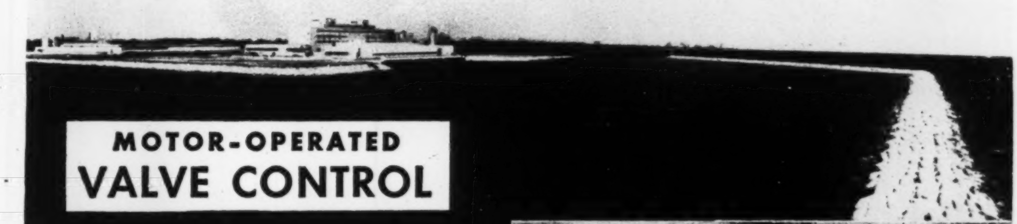
and now—a PORTABLE *Limitorque*



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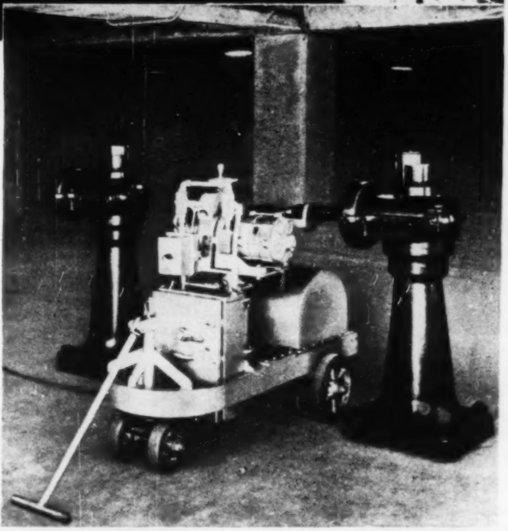
VALVE CONTROL

. . . at South District Filtration Plant, City of CHICAGO

Something new . . . here's the well-known and widely used *"Limitorque"* Motorized Valve Operator, in *Portable form,* adapted for use wherever a hand-drawn truck can be wheeled to a Valve or Sluice Gate location. — It may be quickly connected to a power outlet . . . and automatic *electric opening and closing is readily secured.*

This portable "Limitorque" is equipped with the famous *torque-limiting feature* (which operates in both Opening and Closing directions); *The limit switch* which may be set for any desired travel (automatic resetting); *A Universal Joint connection* is also provided for compensation of misalignment between floorstand and power unit.

This unique method of electrical valve operation is *another first* for Philadelphia Gear Works. It embodies the salient and proven features that have made *Philadelphia "Limitorque" Valve Operators,* the most widely used in the world.



LIMITORQUE
CONTROL

The *Portable "Limitorque"* shown directly above was built to the exacting specifications of the Filtration Division Engineers, City of Chicago, Ill. The photo at the top of the page shows a general view of the Filtration Plant taken from South Breakwater Light. (All photos courtesy of South District Filtration Plant at Chicago, Ill.).

Send for 96 page "Limitorque" Catalog and please use your Business Letterhead when requesting same.

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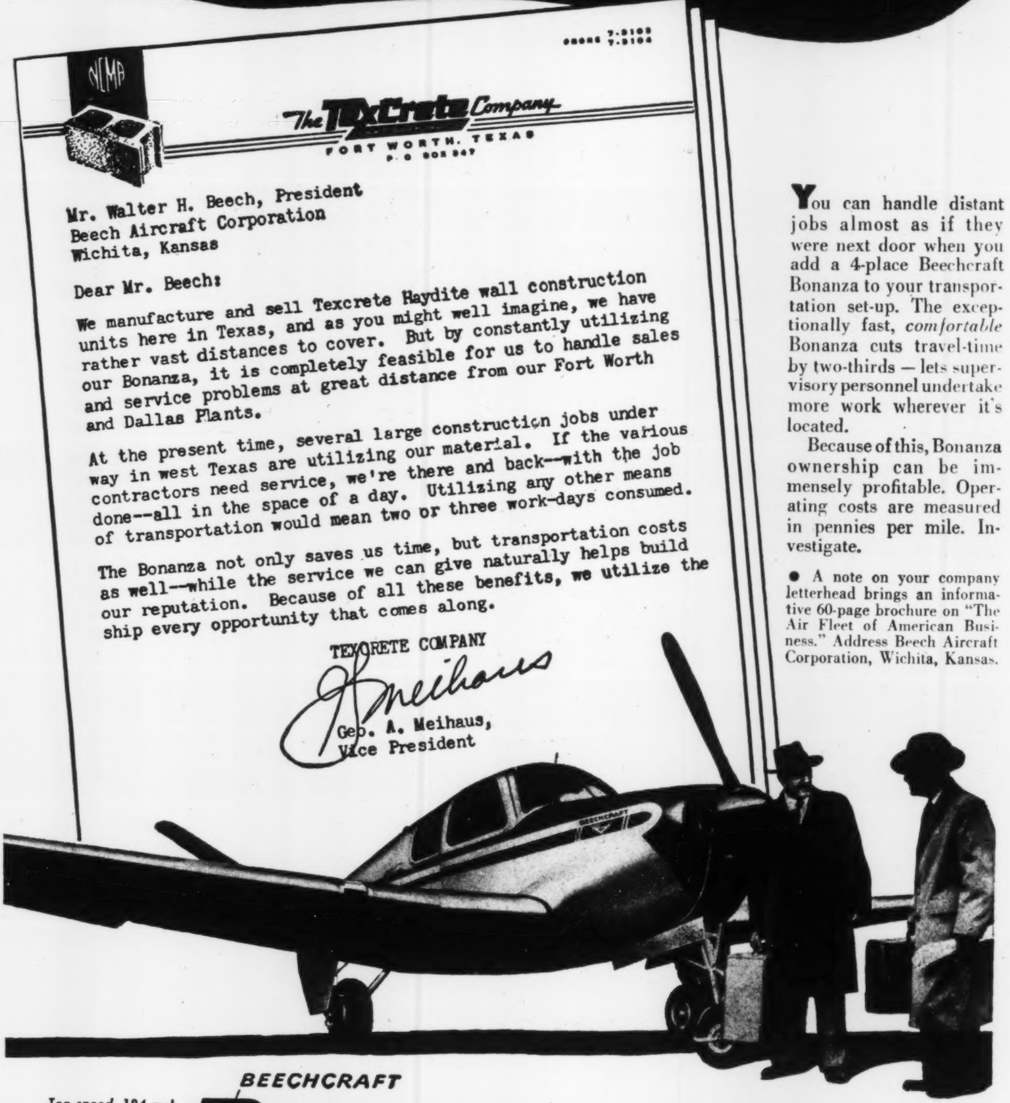

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Beech Aircraft Corporation
Wichita, Kansas

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G. A. Meihaus

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Vice President

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Because of this, Bonanza ownership can be immensely profitable. Operating costs are measured in pennies per mile. Investigate.

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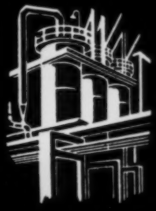

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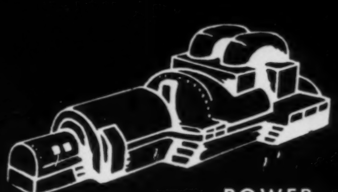
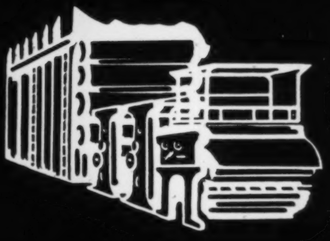
PETROLEUM



POWER

WATER WORKS



PAPER

NEW BETHLEHEM FLOW TUBE*

SIMPLIFIES WATER FLOWMETERING

Here's the new primary device that's simplifying the measurement of rate-of-water-flow for water works and sewage engineers across the country—the Bethlehem Flow Tube. Tested, proved, and approved in scores of installations, it offers top accuracy, minimum loss in head, with freedom from the usual restrictions.

The Bethlehem Flow Tube is adaptable to any and all flow measuring instruments. Normally less than one pipe diameter in length, it is easy to apply . . . inexpensive to install. Symmetrical construction permits measurement of flow in either direction. With negligible resistance to flow and freedom from most straight run limitations, the Bethlehem Flow Tube is the answer to a long-needed improvement in flow primary devices.

Find out how this new primary element can cut your metering costs . . . give you greater accuracy . . . now! Write for the folder "Bethlehem Flow Tube."

*Gentile Patents—Pat. No. 2,260,019. Other patents pending.

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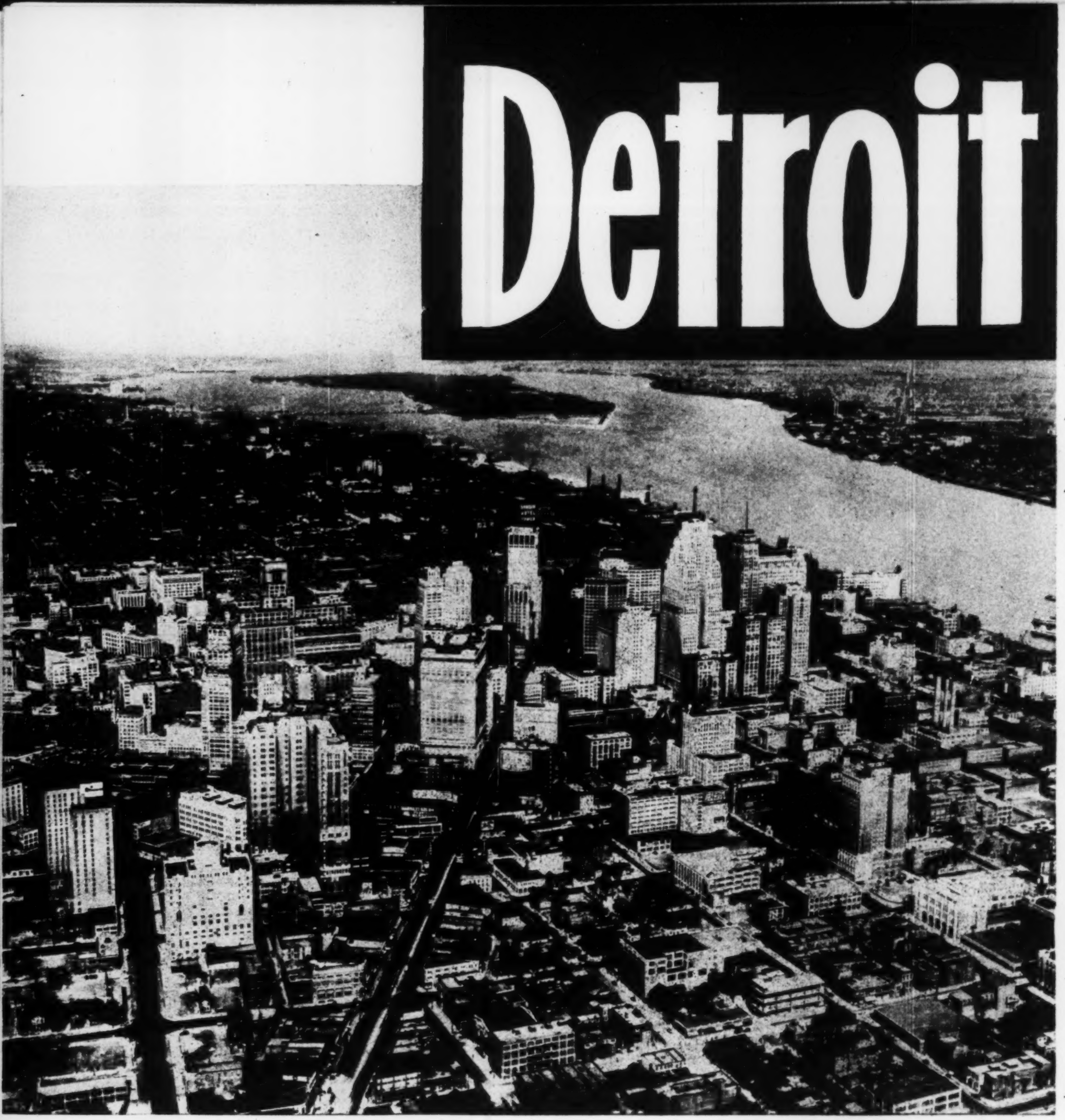


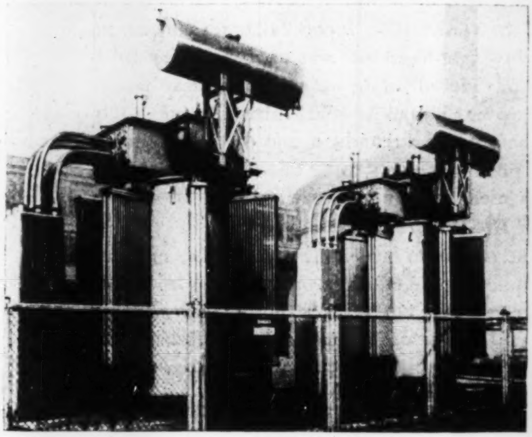
Thrifty Cities See *Dollars Go Further* With Reliable, Low Maintenance A-C Products

THAT'S WHY so many cities — large, medium and small — are using more and more Allis-Chalmers equipment today. Detroit's sewage pumping stations and disposal plants for years have used Allis-Chalmers synchronous motors and transformers. One water works pump station is equipped with a battery of A-C centrifugal pumping units.

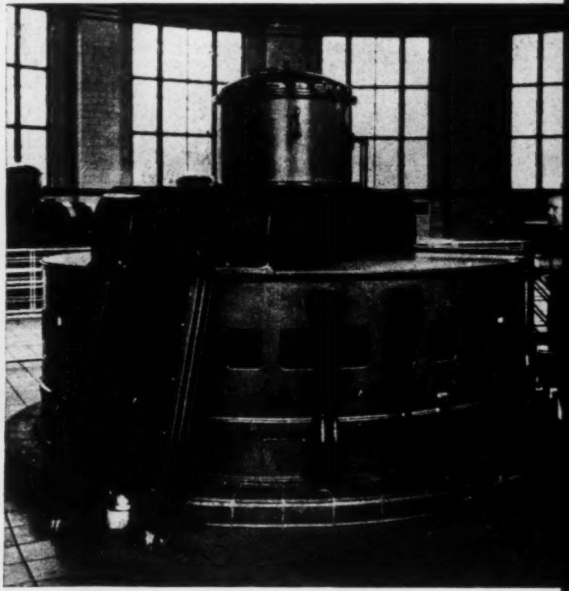
Tax conscious cities, caught between lagging incomes and rising costs, are discovering that *budgets go further* with A-C equipment. A-C centrifugal pumps, for example, have met every efficiency rating guaranteed for them. Allis-Chalmers motors and turbines are designed to fit the specific pump for which they are built. Electric power needs are met with Allis-Chalmers power and distribution transformers . . . protected, controlled and regulated with A-C metal-clad switchgear and control devices.

No other company offers coordinated equipment engineering for so many electrical and mechanical public works products. For more information on how *your* city can benefit from buying Allis-Chalmers equipment, we will send you a free copy of Bulletin 25B6607. *Write for it today.*

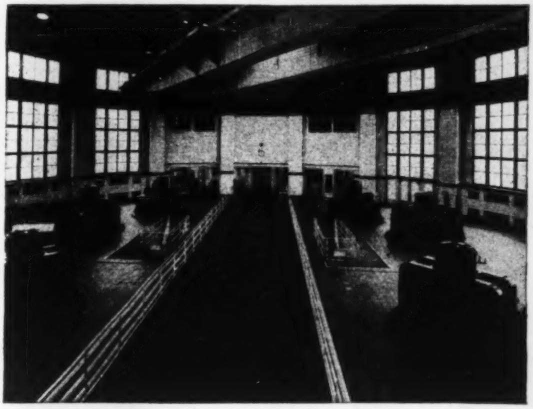
KNOWS DEPENDABLE MUNICIPAL EQUIPMENT!



THESE "Old Faithfuls" have given dependable service in Detroit's public works for many years. Today, new Allis-Chalmers transformers can be equipped with Load Ratio Control devices to provide close voltage regulation during the hours of peak load and low load pumping periods.



CIRCULAR shaped Detroit sewage disposal plant pump room is equipped with six Allis-Chalmers synchronous motors. Your community can save money by taking advantage of Allis-Chalmers experience in designing and building both electrical and mechanical public works equipment.



1250 HP synchronous motors drive sewage pumps in Jefferson Avenue sewage disposal plant. Allis-Chalmers has designed and manufactured all sizes and types of motors and turbines for driving centrifugal pumps for all sizes of communities all over the country.

WELCOME A.W.W.A.

When your convention meets in Chicago, May 29 through June 3, Allis-Chalmers extends to each of you the wish that your stay will be both pleasant and profitable. We invite you to drop in and visit our exhibit in the Stevens Hotel. We'll be in booths 133, 134.

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MATCHES DEPENDABLE 'INCOR' HIGH EARLY STRENGTH

JUST 20 YEARS AGO, 'Incor' 24-Hour Cement with lightweight aggregate was used in precast roadway and sidewalk slabs for the double-leaf bascule bridge over Chicago River at Wabash Avenue: 3400-lb. compressive strength in one day . . . concrete slabs piled by crane 8 to 20 hours after casting . . . forms used twice a day, saving 50%. *Dependable 'Incor' HIGH EARLY service strength.*

Concrete had to be dense, watertight : : : moisture absorption would affect balance between leaves and counter-weights: 20 years' exposure have had no effect on the span's delicate balance . . . "Maintenance-free service has saved City money," say Bridge Engineers. *Dependable 'Incor'* LONG-TIME durability.* Typical performance of America's FIRST high early strength portland cement.

*Reg. U. S. Pat. Off.

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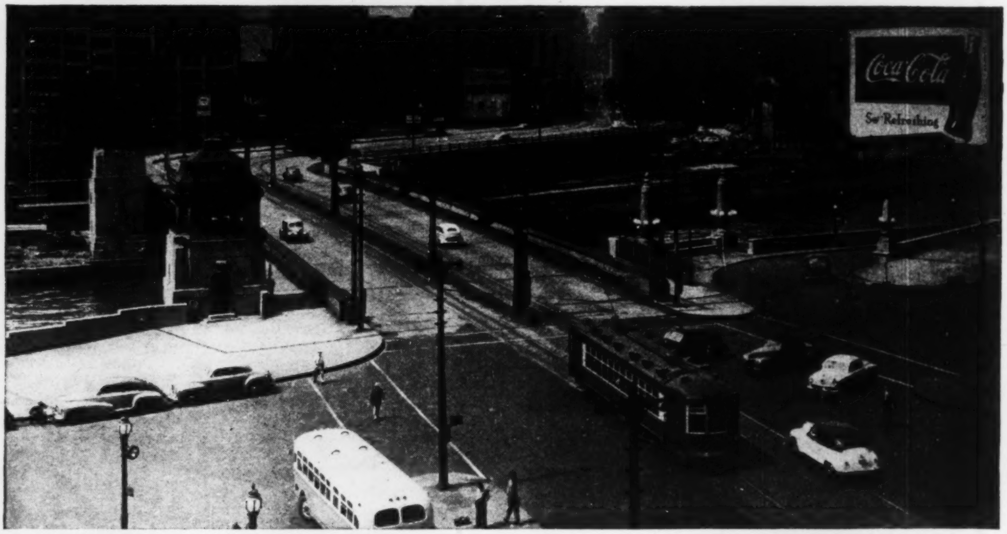
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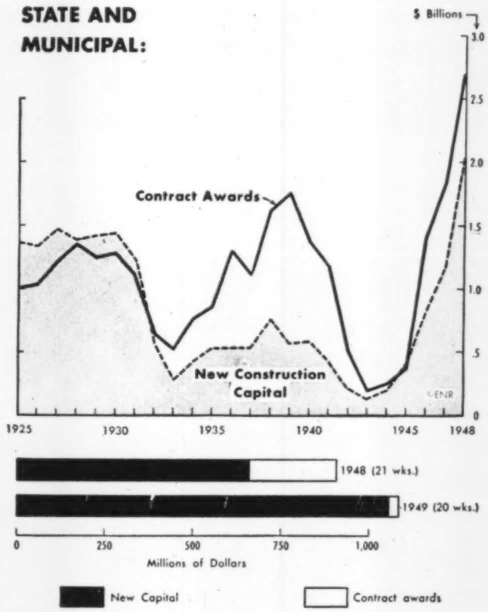
CONSTRUCTION TRENDS



New capital figures forecast business gain

An important signal for construction business is flashing green.

ENR's reports on bond sales for construction are running more than 50% ahead of a year ago. Before the war, an upturn in state and municipal bond sales consistently meant an upturn in construction. Does more construction financing now mean there's more work coming along?

As it stands now, ENR's reports on new capital for construction show corporate securities issues running 38% ahead of 1948 and state and municipal financing 68% above last year.

Of the two, the state and municipal figures are the better indicator of business. Corporations currently rely on security sales for only a small fraction of their total capital funds. Last year, for example, borrowing provided only about one-fifth of their total needs. The great part of corporations' new capital came from profits and reserves built up to replace plants and equipment. So profits—and what companies expect future profits to be—must be considered along with bond issues in sizing up prospects for industrial and commercial construction. Proof of this: corporate security issues are half again as high as last year, but industrial contract awards, as reported to ENR, are only 8% ahead of last year.

But the fact that state and municipal financing is rising probably does mean there's more of this work on the way.

A glance at the chart shows that contract awards have trended the same way as new construction financing fairly consistently over the years. Awards bulge well above financing during the depression years because the financing figures do not include federal grants to municipalities and states. Even so, the trend of awards pretty well parallels the financing figures.

The war muddied the financing picture. The states, for example, built up reserves during the war years when their revenues ran ahead of expenditures. After VJ-Day they drew on their war-chests to finance construction. But by now the war-chests are pretty well gone and local public works again rely heavily on borrowing to finance construction.

The war and rising costs also forced a change in financing. States and cities got temporary financing to carry jobs through, then issued their bonds when the job was complete and they were sure there would be no contingency costs to run up estimates. That meant that the bond issues often came after the work was done—instead of leading the actual work by a few months.

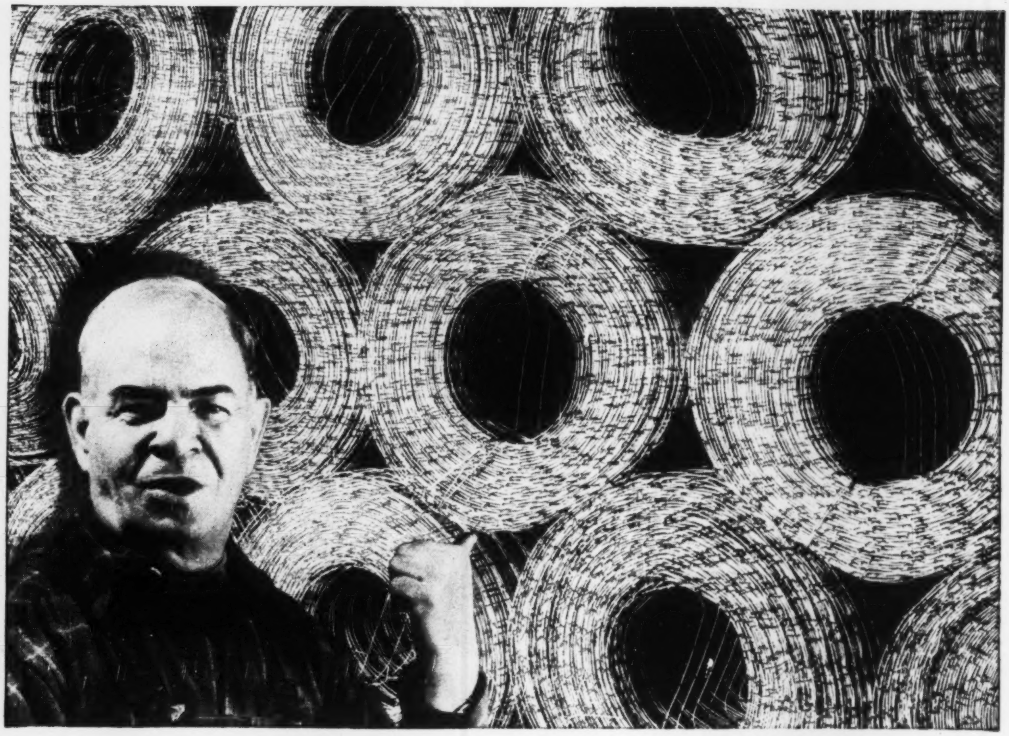
Now financing is gradually changing back to the prewar pattern. Financing again comes before contract awards in many cases. And that means that the figures on financing are again becoming indicators of construction prospects.

Does today's 68% gain in financing over last year mean that state and local construction will rise something like 68%?

Not quite. Part of the gain in state and local work is already showing in contract awards—they are running 26% ahead of last year now. Part of it, too, offsets war reserves that were being used to finance construction last year.

But both the financing figures and field reports on the plans of state and cities indicate there will be an increasing volume of that work coming along.

So—it becomes more important than ever to watch ENR's figures on new capital. As non-federal financing settles into a postwar pattern, ENR will keep a continuing check on it. It promises to be one of the industry's best forecasters of what's ahead.



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Both plain and galvanized wire fabrics are on hand. Sizes include: 6 x 6 spacing in 10, 8, 6 and 4 gauge—4 x 4 in 13 and 10 gauge and 2 x 2 in 14 and 12 gauge. Our engineers will gladly recommend the correct size and gauge to give necessary strength at lowest possible cost. And we can promptly furnish special sizes from mill.

Ryerson construction steel service also covers Hi-Bond reinforcing bars, steel spirals, structurals, plates, caisson rings and many other products. Call your nearby Ryerson plant for welded wire fabric and every other construction steel requirement. Though current demand often depletes our stocks of some products we urge you to send us your inquiries and orders.

NEED EXPANDED METAL?

Ryex Expanded metal—a strong, diamond-pattern reinforcing is available in large or small quantities. It's ideal for repair of walls, dams, paving, and for all types of gunite work. Wherever flat, rigid reinforcing of good bonding strength is needed use Ryex. Shipment is immediate.

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THE CONSTRUCTION WEEK

DOWNTREND GROUNDS TRUMAN — The things that are grounding the President's program (ENR May 19, p. 5) are apparent in the business figures that experts are beginning to piece together. The trend is down—not dangerously so—but still down. Examples: Employment is set for 60 million by June, about 1.5 million under 1948; business inventories are about six percent higher than a year ago; dollar sales in both durable and non-durable goods are down; personal income has dropped a bit—though still on a par with a year ago. All of which puts Congress in the middle—government income will be less, but lawgivers don't want to increase taxes. On the other hand, economy-minded Congressmen couldn't make stick even their demand for a modest five percent cut in the President's spending program.

TESTING RANGE — Congress has finally approved a $200 million testing range for guided missiles, to be built possibly somewhere along the Florida coast. As approved by both houses, a measure authorizes the Secretary of Defense to institute planning for the proving ground (with a $75,000,000 initial expenditure) and delegate administration to one of the armed forces—probably the Air Force.

BIGGEST FLOOD CONTROL—On paper, at least, the U. S. is now embarked on the biggest flood control program the world has ever seen—$7.5 billion worth. Reviewing the work for the House Public Works Committee last week, Maj. Gen. Lewis A. Pick, Chief of Engineers, said that nearly 1,000 projects now on paper would call for a program that large. To the present, Congress has authorized projects to cost $3.6 billion, provided $2 billion cash for them.

CONVEYOR OUT—The Ohio state legislature has killed the plan for the seemingly fantastic—but apparently practical—140-mi. conveyor belt that would have brought ore and coal from near Pittsburgh to the Great Lakes (ENR Feb. 10, p. 5). A state House committee, considering an application to permit construction of the conveyor line, last week pigeonholed the measure.

VISITORS WELCOME—Public relations is more than a phrase to the Bureau of Reclamation. It has invited tourists to visit the construction site of huge Hungry Horse Dam, now under construction the south fork of the Flathead River in Montana. Descriptive folders will go to state chambers of commerce and travel agencies; guides will be on duty; a visitors' observation platform will be built; and a large scale-model of the dam will be on display.

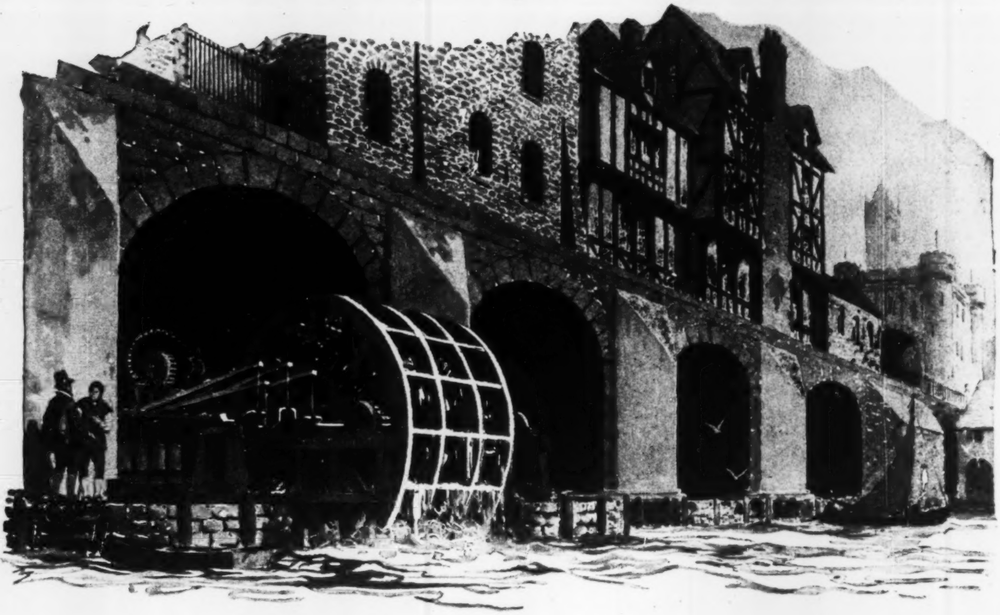
MORE TRAFFIC—Indicating heavier use of the nation's highways, the Public Roads Administration said last week that 30.6 billion gallons of motor fuel were sold in 1948—2.2 billion more than in 1947. And the 1948 gallonage doesn't include 4.6 billion sold for government use, or for off-the-road equipment. The sales, incidentally, resulted in tax collections of more than $1.3 billion to the states.

GAS GOES WHERE? — Seeking a market for newly discovered natural gas sources in Alberta, the Canadian parliament has approved a plan for piping gas across the Canadian Rockies to Vancouver, and thence south to reach Northern California. Insiders believe that despite the action, the project is only in the talking stage. They point out that Pacific Gas and Electric—the obvious customer on the U. S. side—says it hasn't been consulted, and the PG&E has already started building its own line from Texas fields.

NON-COMMIE OATH FOR ALL?—Businessmen may soon be compelled to file a non-communist affidavit before appearing before any government agency, just as labor people must do now to get the services of the National Labor Relations Board. A bill recently introduced in the Senate proposes that no federal agency accept applications for any kind of license, unless applicants swear they aren't communists, don't belong to organizations advocating forcible overthrow of the U. S. government.

SUPER CO-OPS—Something new is being added in rural electric power systems. It's to be a federally-financed "super cooperative"—a sort of holding company cooperative—organized to generate and transmit electrical energy for local co-op distribution systems in farm areas. The Rural Electrification Administration recently approved a $7,500,000 loan to the Central Electric Power Cooperative of Columbia, S. C., for construction of 834 miles of transmission lines to carry power from a state hydro project to 14 REA-financed distribution co-ops. REA reports that co-ops in at least 16 states are considering construction of generating and transmission facilities.

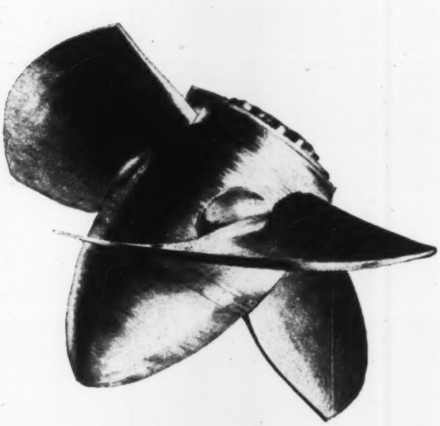
in 1582 when this machine pumped London's Water



SKIP the centuries!

In this country alone there are systems that would shame London's great contribution, even in our smallest towns.

A Parade of Progress in which Smith Rotovalves and Axial Flow Pumps have marched in the very forefront! Good reason for putting your hydraulic problem in our hands, isn't it?



S. MORGAN SMITH Co.
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EDITORIALS

More Jurisdictional Disputes

The American Federation of Labor decision to scrap the machinery set up last year to end work stoppages in the building trades due to jurisdictional disputes can only result in more disputes and work stoppages. Details of the AFL action are given in the news pages.

Last March the Building Trades Division of the AFL agreed with the Associated General Contractors and a group of specialist contractors to set up an arbitration board of two union representatives, two representatives of the contractors and an impartial chairman. It was to arbitrate disputes that could not be settled locally. In general the plan worked well, but there was an undertone of protest on the part of the unions over contractors having any voice in their internal affairs. This must have had its effect on the top men of the Building Trades Division for they now propose a substitute arbitration board made up entirely of union members except for the impartial chairman. Leaving the contractors out would seem to insure more delays because, having no axe to grind, their representatives on the arbitration board gave the board, in effect, three impartial members against two union men, making it possible to decide disputes on merit rather than inter-union politics.

By this latest move, the Building Trades Division may find the National Labor Relations Board moving in to settle its disputes—which was an eventuality that it had hoped to avoid by setting up the joint board last year.

Fire Safety Is Up to Architects

The recommendations for a new basic fire prevention code by the Illinois state fire marshal (p. 36, this issue) deserve full consideration. However, the La Salle Hotel fire in Chicago (61 lives), the Canfield Hotel fire in Dubuque (19 lives), the Winecoff Hotel fire in Atlanta (119 lives)—and most recently the St. Anthony Hospital fire in Effingham, Ill. (at least 74 lives)—make clear that neither further legislation nor governmental inspection can be relied on to prevent similar disasters in the future. Only architects have both the knowledge of fire-safety principles and the necessary influence with owners effectively to eliminate fire hazards.

The St. Anthony Hospital catastrophe bears out this conclusion. Nobody knows what started the fire, but inspection of the damage reveals several of the many reasons for the large loss of life. They are given in a 23-pp. pamphlet, "The Tragedy of St. Anthony Hospital," by James K. McElroy (National Fire Protection Ass'n., 60 Batterymarch St., Boston 10, Mass., Price, 35c.)—which should be must-reading for architects.

Mr. McElroy points out that property loss alone exceeded $1,000,000. Yet the fire could have been put out immediately, or quarantined, by installing sprinkler heads in chutes, smoke barriers in the corridors, fire doors at one wood stairway; by replacing a second wood stairway with an inclosed one of incombustible material; and by coating the combustible fiberboard ceiling with fire-retardent paint—at a cost of $8,850.

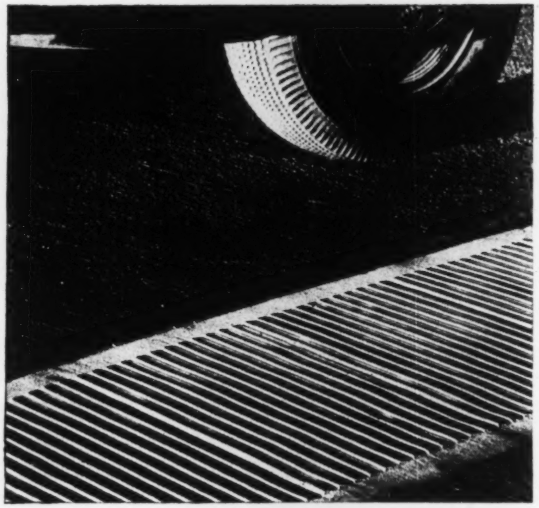
The conclusion is inescapable that arrangements were not sufficient for pre-fire evaluation and correction of the hazards. Undoubtedly, this conclusion applies also to many public buildings throughout the country. Passing more laws, however, would not change this. In Illinois, for example, there are only 13 men in the state fire marshal's office available to inspect 218 hospitals located outside the city of Chicago. As a result, even existing laws—imperfect as they may be—cannot be enforced adequately. The St. Anthony Hospital had been inspected last in 1944.

Obviously, as Mr. McElroy points out, hospital administrators who wait for inspections by public officials do themselves and their communities a disservice. Also, he points out, few hospitals make physical changes in their buildings without the services of an architect. Consequently, while others may be involved, responsibility for fire protection basically rests with architects. When they design structures with combustible materials, they should make ample provision for protecting the occupants against fire and smoke. And when they serve as consultants to owners of buildings that do not comply with the latest fire-safety standards, they should recommend that the necessary alterations be made.

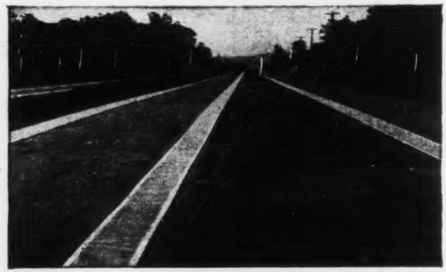
Speeding Airport Construction

Complaints that needless red tape and unusual restrictions are hampering the airport building program of the Civil Aeronautics Administration have had their effect. The CAA has acted to eliminate or modify several of the major causes of delay (ENR May 12, p. 54). Preliminary plans do not have to be prepared in as much detail as heretofore, special searches of property titles are no longer required, construction contracts can be negotiated where that seems desirable instead of being let on a competitive-bid basis, and progress payments to contractors can now be on a more liberal basis, which should assist in getting better bids. This liberalization of restriction should help materially in getting more airport modernization and construction under way. Despite optimistic announcements from CAA headquarters as to progress on the 7-year, $500,000,000 federal-aid airport building program that was approved in 1946, the program had bogged down badly and is far behind schedule.

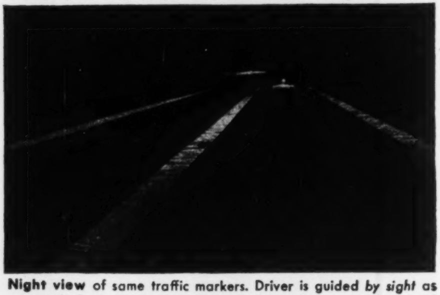
SINGING HIGHWAY SOUNDS KEYNOTE OF SAFETY



NEW DOUBLE-DUTY TRAFFIC MARKER GUIDES DRIVERS BY SOUND AND SIGHT . . . BOTH DAY AND NIGHT



Daytime view of two traffic markers on 3-lane highway in New Jersey shows contrast of Atlas White Cement against regular pavement gray. Visibility is high. (White Concrete Reflecting Curb at left.)



Night view of same traffic markers. Driver is guided *by sight* as saw-tooth faces reflect headlights back to driver, and *by sound* should car veer out of lane and tires pass over corrugated surface.

Ribbed and white, this new traffic lane separator does double safety duty. Both by day and by night, it clearly defines the road ahead . . . and hum-m-ms a warning when drivers steer out of lane.

Made with Atlas White Cement, the slightly corrugated surface of this traffic marker is built flush with the highway level. By day, its white visibility is unmistakable. By night, independent of overhead illumination, its saw-tooth faces catch headlight rays, reflect them *back* to the driver, and form a guiding ribbon of light.

In addition, by day or by night, in weather that may be clear, rainy or foggy, should the driver veer out of lane, the ribbed surface causes a distinct hum or whine when tires ride the corrugations.

Thus, by sound and sight, both day and night, drivers are doubly guided in keeping their cars in lane. Traffic is channelized, moves faster and safer.

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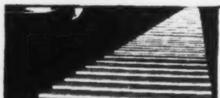

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ENGINEERING NEWS-RECORD

MAY 26, 1949 VOL. 142 NO. 21

Construction unions scuttle jurisdictional disputes pact

AFL-AGC-Specialty Contractors agreement appears broken as building trades group gives termination notice—Unions propose own program, without contractor participation

By Joseph Gambatese
Washington News Bureau

The "noble experiment"—a contractor-labor agreement for settling jurisdictional disputes between American Federation of Labor building trades unions—was on the verge of breaking up last week. The unions were planning their own settlement machinery, leaving the contractors out of the picture.

Hailed more than a year ago (ENR Feb. 19, 1948, vol. p. 235) as a major step toward keeping order in the construction industry, the agreement has been operating lately to an undertone of grumbling from labor members. When it went into effect officially on May 1 last year, the agreement provided for renewal on Dec. 31. It had not been renewed, but was operating on an interim extension while a joint committee tried to work out union objections to the plan.

Meeting ends pact

Finally, AFL Building Trades Department chieftains, meeting at Cleveland last week, decided to give 30-day notice to other signatories indicating that labor wanted to terminate the pact.

The AFL decision was announced in newspaper dispatches, but at week's end the participating contractor associations (the Asociated General Contractors and eight national associations of specialty contractors) had not received an official termination notice. There was no doubt that the Building Trades really intend to break up the plan, under which a national joint board of two union and two contractor representatives, and an impartial umpire (John T. Dunlop of Harvard University) decides conflicts over union jurisdiction that are not covered by existing agreements or decisions of the AFL.

On Wednesday, two days after the AFL made its announcement in Cleveland, the nine-man board of trustees of the plan met in Washington and decided to continue considering applications for jurisdictional decisions. Contractor representatives on the board are James D. Marshall, assistant managing director of AGC; Edward P. Palmer, president of Senior & Palmer, Inc.; Paul M. Geary, executive vice-president, National Electrical Contractors Association; and H. R. Cole, executive secretary, Tile Contractors' Association.

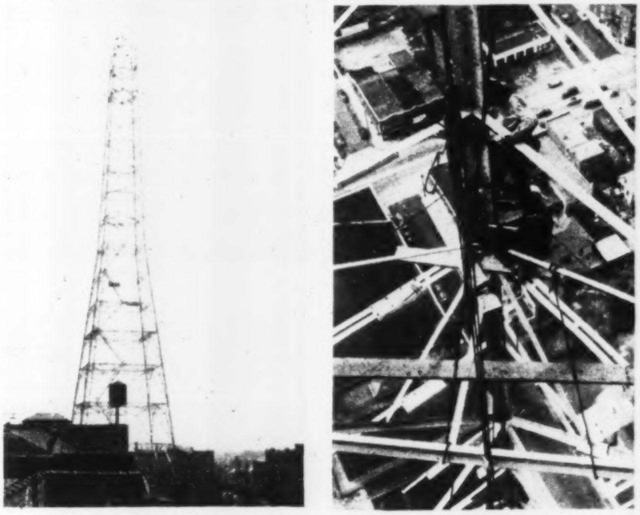
Reason for the AFL decision given by Richard J. Gray, president of the AFL Building and Construction Trades Dept., and treasurer of the joint board's board of trustees, was that the contractors were bringing too many cases to the board. The implication was that the contractors were creating disputes, where none existed before, by assigning work to unions other than those which had been doing the work.

The AFL organization raised this point at its convention in Cincinnati last November. It decided then to propose changes in the plan which would limit the contractors in the cases they could bring to the board (ENR, Dec. 16, 1948, p. 17).

The contractor groups deny the AFL's charge. Only Cole of the tile contractors, however, made a public statement before official notice of the AFL's decision had been received. Cole said:

1. The AFL charges were not correct.
2. The contractors have been ready at all times to negotiate any changes in the joint board machinery, but the AFL has not made any concrete sug-

(*Continued on p. 41*)



GOING UP—The highest structure in the State of New Jersey will be this 760 ft. steel tower now being built by Radio Station WOR at North Bergen. When completed this summer, the structure will be topped by antennae for a new television station. From its base, atop the New Jersey palisades, it will tower 1,050 ft. above sea level. It will be higher than the Eiffel Tower, and within 200 ft. of the height of the Empire State Building; 96 ft. square at the base, and 5 ft. square at the top. Members are being bolted to the frame high above North Bergen roof tops at right. (Wide World Photos).

NEWS BRIEFS

Library Ready—The Harvey S. Firestone Memorial Library at PRINCETON UNIVERSITY (ENR Dec. 11, '47, vol. p. 808) was formally dedicated recently. The Gothic building cost $6,000,000 and has storage space for 1,800,000 volumes. Architect was Robert B. O'Connor; Weiskopf & Pickworth were structural engineers; and the builder was the Turner Construction Co.

Texas Offices—The largest office building in the southwest will be built by the Republic National Bank of DALLAS, TEX. The base of the building, on the $2,000,000 site on Pacific Ave. adjacent to the Medical Arts Building will cover a 45,000 sq. ft. area.

Oregon Dam—First bids on construction of Meridian Dam on the middle fork of the Willamette River 23 miles south of EUGENE, ORE., will be opened June 15 by the Corps of Engineers at Portland. The work involves excavation for a spillway and construction of an earthfill embankment at an estimated cost of $2,000,000. Meridian, a unit of the Willamette basin project, will be a combination flood control and power dam. Estimated cost of the completed dam is $57,000,000.

Halt Bridge Slip—Army Engineers at Philadelphia have started work to stop Summit Bridge from slipping into the CHESAPEAKE AND DELAWARE CANAL. Giant steel piles are being driven in front of the north abutment, Col. F. F. French, district engineer, said. A month ago it was discovered that the 32-ft.-high concrete abutment had moved forward six inches. The Army Engineers closed the bridge and diverted Routes 71 and 896 auto traffic to the Chesapeake City, Md., ferry.

Tennessee Institutions — The state building commission of TENNESSEE has approved a 2-year $6,650,000 building program for educational institutions. In the next two years it is planned to spend $4,500,000 to improve and expand penal and charitable institutions.

N. Y. Hospital — Contracts totalling $8,109,770 have been awarded for the construction of a 960-bed, medical-surgical building at the Hudson River State Hospital, POUGHKEEPSIE, N. Y. Construction of this 9-story hospital initiates N. Y. State's program to alleviate overcrowding in mental hospitals. The main contract went to Merritt, Chapman & Scott Corp., New York, at $6,538,931.

Highway Efficiency—KENTUCKY has a four-point program of increasing highway maintenance efficiency at reduced costs—larger maintenance districts, new and improved equipment, better supervision, and more work from its maintenance crews. Highway Commissioner Keck recently warned that "the holiday for maintenance employees is over." Better supervision and more efficient operation of equipment will be secured by grouping the 10,000 mi. of state-maintained roads in districts of three of four counties each, instead of on a county basis, as in the past. Kentucky's maintenance budget for the current fiscal year is $10,500,000.

New Health Body—SOUTH DAKOTA's State Board of Health has been replaced by a State Department of Health, administered by a public health advisory council. This nine-member group is to be appointed by the governor, and one of its members is to be a licensed engineer.

◆

Communities push plans for hospital work

Hospital consrruction programs totalling more than $26,000,000 were reported at widely scattered points last week. Most of the projects were municipally or privately financed.

Biggest plan was at Ottawa, Ont., where city officials said that expansion moves—already under way or in final planning stages—would increase bed-capacity more than 1,000, at a cost of $10,000,000.

Other large projects included: A new general hospital for Galveston, Tex., where a $4,567,700 contract was awarded to the J. W. Batson Construction Co., of San Antonio; a start on a $2,400,000 Providence Hospital at Mobile, Ala.; and approval by the state of Pennsylvania of a $4,000,000 psychiatric institute, to be built at Philadelphia.

At Effingham, Ill., scene of the recent disastrous hospital fire (ENR April 14, p. 51), a citizens' committee began planning a $2,400,000 structure to replace the wrecked institution. Other building fund planning was being carried forward at Louisville, Ky., where citizens hoped to raise $1,000,000 for construction of the proposed Our Lady of Peace Hospital.

At Boston, Mass., the Veterans Administration announced tentative selection of a site at Brockton, Mass., as location for a new 1,000-bed VA neuropsychiatric hospital. The 275-acre plot will be deeded as a gift from the city.

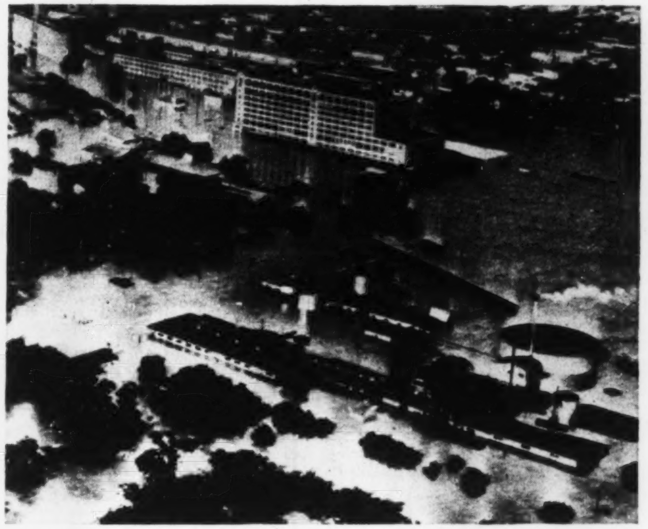
Arthur S. Tuttle dies New York consultant

Arthur S. Tuttle, 83, former chief engineer and consulting engineer to the Board of Estimate of New York City, died in Brooklyn May 19.

Despite his advanced years, Mr. Tuttle had been active in engineering work until a few months before his death, coming almost daily to the office of The Haller Companies where he had served as consulting engineer and chairman of the board since 1945.

A graduate of New York University in 1885, Mr. Tuttle devoted most of his active engineering career to the cities of Brooklyn and New York, serving the Board of Estimate of New York City continuously from 1902 until 1933, being chief engineer from 1921 to 1928. Upon his retirement from his position as consulting engineer to the board in 1933, he was immediately drafted to be director of public work in New York State for the Public Works Administration, where he remained for four years, resigning in 1937 to go into private consulting work.

Mr. Tuttle served the American Society of Civil Engineers as a director, treasurer, vice-president and then as president in 1935. He was elected to honorary membership in 1938.



CLEAR FORK CUTS LOOSE—Ten lives were lost and $12,000,000 worth of damage done when the Trinity River flooded Fort Worth, Tex., last week. (Wide World Photo)

Trinity tops levees, floods Ft. Worth

A cloudburst over Fort Worth, Tex., that brought over 12 in. of rainfall within about 12 hours, last week pushed the already swollen Trinity River into a vicious but short-lived flood. Earth levees were overtopped and failed at seven points; the resulting flood drowned ten and left 13,200 homeless in outlying residential and business areas.

Coming as a climax to a series of storms that had been ravaging north Texas, the deluge caused damage estimated at $12,000,000 in Fort Worth; then the flood crest moved on to inundate parts of Dallas, thirty miles eastward.

Emergency repairs were rushed on Clear Fork levees at Fort Worth by Army Engineers under Col. B. L. Robinson, Galveston District Engineer. No estimate had been made on the cost of immediate reconstruction; Col. Robinson was quoted as being "not so much concerned with cost right now as with speed." Local officials formulated a plan requesting a $500,000 congressional appropriation for floodways to coordinate with operation of Benbrook Dam, on which construction started two years ago.

Benbrook Dam is under way on Clear Fork, which meets West Fork of the cantankerous Trinity at Fort Worth. This $16,500,000 flood control and water conservation project is about ten miles southwest of the city, and it is believed that last week's flood would not have occurred had the dam been completed.

About 416 sq. mi. of the Clear Fork drainage area is above the dam site. The reservoir will hold 170,400 acre ft. of storage behind a structure 9,200 ft. long, 130 ft. high. Construction was started in May, 1947, and completion is set for 1951. Two contracts are under way now: Outlet works are being built by Ottinger Bros. Construction Co., Oklahoma City, for $1,000,000; their work is roughly 65 percent complete. The embankment and spillway are under construction by List and Clark of Kansas City, Mo., for $4,260,000; they are only some 10 percent complete on their 5,200,000 yds. of embankment.

According to James A. Cotton, in charge of the Army Engineers' Fort Worth office, high water at Benbrook submerged the oulet works but did no structural damage as far as can be determined. Contractor's equipment was inundated.

Three dams on the West Fork above Fort Worth apparently were sufficient to keep that stream under control. These are Bridgeport, Eagle Mountain and Lake Worth.

Breaks in the Clear Fork levees occurred after overtopping by waters backed up behind driftwood jams at bridges. At one Army gage where flood stage is 17 ft., the crest reached 26 ft.

Damage to structures included permanent loss of two of the city's bridges. Many county roads and bridges were washed out and at least one reinforced concrete span was reported to have failed.

Ft. Worth's municipal waterworks were inundated. Water supply was knocked out for most of the city when Holly plant stopped pumping. Some outlying sections received continued service from water supplied from reservoirs; others received water from wells of private industries at 46 distribution points set up over the city.

Health precautions taken

Over 19,000 persons were innoculated against typhoid fever, and no problem was reported. Emergency pumps were manned to keep sewage treatment works functioning. Water service was returned to near normalcy on the fourth day following the storm.

Water rose to rooftops in residential areas. There was little opportunity for warning. Emergency shelters were provided to take care of the homeless and injured; the health department closed all drug and food stores in the flooded sections of the city.

Levees damaged were built by the Levee Board organized in 1911 after the 1908 flood. This was the second time they had failed; on April 25, 1922, an earlier break occurred. At that time 14 lives were lost and $2,500,000 damage was done. Engineers estimate last week's discharge at about 80 percent of that in 1922.

◆

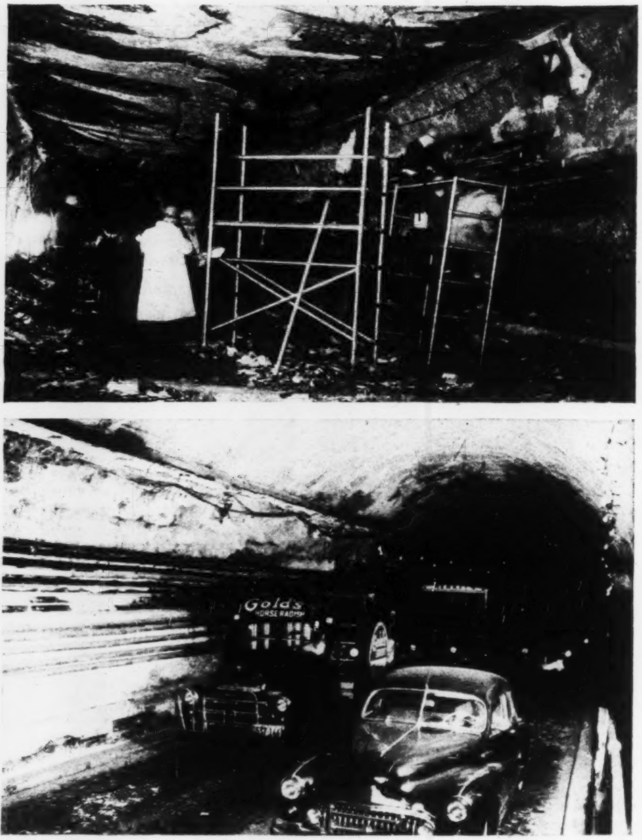
U. S. OK's meteorological group to be part of UN

President Truman has ratified the convention of the World Meteorological Organization, aimed at standardized weather reporting. Senate consent to ratification previously had been given on April 20.

The United States is the seventeenth government to ratify the convention. It will become effective 30 days after the thirtieth country ratifies it.

When it goes into force, the convention will establish the World Meteorological Organization. Basic objectives of WMO are to coordinate, standardize, and improve world meteorological activities and to encourage efficient exchange of meteorological information between countries.

As soon as WMO comes into being, it will take its place as one of the specialized agencies of the United Nations—along with the aviation, telecommunications, and postal organizations dealing with problems of transport and communications.



FIRST REPAIRS on the eastbound tube of the Holland Tunnel, following the recent explosion and fire (ENR May 19, p. 11), included communication lines burned out in the blaze. Cleanup crews worked fast to remove damaged ceiling and provide emergency lighting to make the tube useable. Normal traffic has been resumed during day-time hours, while repair work proceeds at night. (Photos by Wide World and Port of New York Authority)

Marshal reports on fire, asks more stringent laws

Illinois State Fire Marshal Pat Kelly has recommended a new fire protection code to prevent recurrence of the recent tragedy at St. Anthony's Hospital in Effingham (ENR April 14, p.51).

The new code, urged for adoption as a state law, provides:

1. That all places of public assembly have fire detection and protection devices.

2. That periodical inspections be made where no local fire prevention codes exist, and that existing codes match the state code in requirements.

3. That a qualified engineer be added to the office of the state fire marshal.

In his final report to Gov. Adlai E. Stevenson on the Effingham disaster, Mr. Kelly stated that the 73-yr.-old hospital had unprotected vertical and lateral openings and practically no emergency fire-fighting or detection equipment. A combustible organic fiberboard covered ceilings, upper walls of corridors, and entire partitions of the third floor attic. Age-dried woodwork was freshly painted, in part, and generally covered with many coats of paints and varnishes.

This report gave only reasons for the rapid spread of the fire; investigations failed to determine the cause.

In asking enactment of the fire prevention code, Mr. Kelly warned that other public buildings throughout the state match St. Anthony's Hospital in fire hazards. He said, "These hazards are being rapidly increased by the use of combustible material in repair and modernization."

◆

Extensive public works are planned for Ohio

George B. Sowers, Ohio State Director of Public Works, has given Governor Lausche a progress report upon the $80,000,000 state building program of the last General Assembly. It shows that, as of March 1, 1949, $54,000,000 worth of urgently needed public improvements, exclusive of highways, have been placed under construction contracts.

An additional $3,000,000 worth of contracts have been awarded since March 1. Plans are nearing completion and contracts will be awarded within the next three months upon another $13,750,000 worth of similar contracts including $750,000 worth of physicians' residences of state welfare institutions.

In this connection, Mr. Sowers says that the construction industry in the state is very hungry for new work, and that the number of bidders has increased two or threefold. Material salesmen are also very active.

The program under contract includes such projects as hospitals for tubercular, mental and general patients; dormitories for university students, war veterans and mental wards of the state; school buildings; power and heating plants; recreational facilities such as gymnasiums, natatoriums, grandstands, fishing lakes; sewage works, water supplies; kitchens and dining rooms; laundries and farm buildings.

During 1949 construction will be in progress upon about 700 contracts involving $45,750,000 distributed as follows:

Unfinished work under contract March 1....	$29,000,000
New contracts since March 1...........	3,000,000
Contracts to be awarded during next 3 months for which funds are available	13,750,000
	$45,750,000

It is not expected that construction contracts can be awarded this year upon the remaining $10,000,000 worth of new buildings for which funds were appropriated by the last General Assembly as work on the plans has not been authorized.

Senate OK's reorganization bill; threatens lobbyists

Chances for enactment at this session of a government reorganization law warmed up several degrees last week when the Senate approved a clean bill. The Senate measure went to joint conference—to be reconciled with the measure passed by the House three months ago.

The Senate bill (S. 256) contains no restrictive exemptions that would prevent the President from transferring executive agencies or creating new secretary posts of cabinet rank. But it does have one catch in it: Either house could veto a presidential proposal by simple majority vote within 60 days after it is submitted. Senator John McClellan, president of the National Rivers and Harbors Congress and ardent defender of the Corps of Engineers, feels confident that this restriction is sufficient to block any shift of Army civil functions to another department.

The House bill (ENR Feb. 17, p. 45) specifically exempts the national military establishment and six other agencies by requiring the President to confine reorganization plans for those units to each agency individually and separately.

On the same day that the Senate passed its reorganization bill last week, the House rules committee approved a lobby probe measure that may prove embarrassing to the Corps of Engineers and its lobbying friends. The committee's approved bill would authorize a Senate-House investigation of lobbying by both private citizens and government agencies and employees.

At least twice on the floor of the Senate, Sen. Henry Cabot Lodge, Jr., has cited chapter and verse in charging lobbying by officers of the corps against reorganization.

As a result of the bad judgment of a couple of his district engineers, cited by Senator Lodge, the Chief of Engineers wrote a blunt order to his organization telling the over-zealous members to remember their place as Army officers and federal employees.

◆

Nationwide move started to seal abandoned wells

The tragic case of Kathy Fiscus, the California child who lost her life by falling into a disused and uncovered well, has had repercussions in various parts of the country.

The Los Angeles County Board of Supervisors in an emergency legislation session ordered immediate capping of abandoned water and oil wells.

All open wells in Massachusetts State forests have been ordered filled. So far 50 open wells were found in the state forests.

Highway engineers of the Cook County, Ill., Highway Department have made a complete check of all of the unprotected sewer openings, unguarded quarries not in use, abandoned clay pits and water-filled ditches in the Chicago suburban area.

The highway authorities of Cook County report that, with proper earth fill, these unprotected traps can be converted into sanitary garbage disposal areas, and that eventually such areas might be turned into small parks and recreation centers.

The Builders Exchange of Dayton, Ohio, has announced it will provide fill-in dirt and gravel free to property owners interested in removing hazardous open excavations and wells.

New Jersey has a number of unsealed and abandoned wells of up to 16 in. diameter, State Geologist Meredith E. Johnson has disclosed. It was announced at the same time that legislation is being drafted to fill up these dangerous places.

PERSPECTIVE . . .

Site Prefabricators, Plus & Minus

Prefabrication may be the solution to the housing problem—but recent experiences of house builders prove that mass production methods alone do not guarantee low-cost construction.

For example, at the Byrne Organization's 1,000-house Harundale project, near Baltimore, large sections of the steel-framed dwellings were constructed in shop buildings in the project area. They were delivered to the site on big flat-bed trailers and assembled with huge cranes (ENR June 12, 1947, vol. p. 950). Originally, Byrne had placed a $5,500 price tag on the houses. The price jumped to $6,750 for a 3-bedroom dwelling when he set up his shop; to $7,450 after assembling started; and to $9,750 after some experience with the method. Only about half the units could be sold at this last figure.

Cost savings achieved by shop fabrication were eaten up by the extra cost of rehandling house parts and of transporting and assembling the large sections. The inclosed shops proved to be an unnecessary expense, because when the ground was muddy, field work stopped—halting the production line anyway. Labor productivity was low, and wage increase totaled 40 percent.

Across the continent, the Kaiser-Burns Panorama City development in Los Angeles offers more food for thought. Immediately after the war this company tried shop fabrication to speed construction and to take advantage of the higher material priorities the government granted prefabricators. When priorities ended, fabrication was abandoned. Material handling proved too expensive.

Now, only the plumbing tree and storage partitions are prefabricated and the wood frame is precut. Lath and plaster is used instead of drywall construction. And some of the work is being let to sub-contractors.

At Levittown, near Hempstead, L. I., on the other hand, is a 6,000-house development where mass production methods are apparently proving economical. These 2-bedroom, wood-frame bungalows have been selling for $7,990 or renting for $65 a month—quite low for the New York Metropolitan area.

When operations are in full swing, Levitt & Sons turn out a dwelling every 16 min. on the average. Crews of men move from house to house, each group repeating the same standardized operation on every unit, from digging foundations to painting. One man may do nothing more than fix bolts in the floor for installing a washing machine. Framing is delivered precut and plumbing pre-assembled. An incentive-pay system for both labor and subcontractors keeps productivity at a high level. And since the company owns its own timber stand, lumber mill and building-materials supply yard, it saves considerable money in purchasing material.

The moral: Prefabrication substitutes for the disadvantages of on-site construction the possibility of high-efficiency shop fabrication plus handling, packaging, transportation and assembly operations. But if these procedures are not performed skillfully, they may make the whole thing impractical. It is not enough to fabricate components economically; every operation must be low-cost.

Road program inadequate, ARBA hears

Concern over the inadequate current highway program was expressed by every principal speaker at the American Road Builders Assn. southeastern states conference at Savannah, Ga., last week. The remainder of the program was devoted to discussions of equipment development for concrete and bituminous road construction and earth compaction.

Joseph S. Bright, deputy commissioner, PRA, declared that a mile-by-mile survey of entire street and road system shows expenditure of $47,000,000 is a "must" over the next 10 years to enable America's roads to meet nation's transportation needs. This is more than double current rate of expenditures. He gave a preview of the report on roads to be submitted soon to public works committees of Congress. Bright reported a decrease of 2.4 percent in composite mile road construction cost index in first quarter of 1949 over average of 1948.

Sen. Dennis Chavez of New Mexico, chairman, Senate Public Works Committee, declared our roads, just as much as our housing, are deplorably inadequate and must catch up with demand created as result of dearth of construction during the war.

Long-range, far-sighted highway programs, announced by various states and based on federal aid of known amounts projected several years into future, would save taxpayers millions of dollars, stated Nello Teer, Jr., president of the contractors' division of ARBA. Savings would result, he declared, from contractors' ability to utilize their tremendous investments in equipment to full advantage instead of the more costly piecemeal manner in which states have tackled the country's much needed highway program to date.

Building of better roads through more economical construction designed to take full advantage of most modern methods and equipment is the highway industry's most outstanding challenge, according to Enoch R. Needles, ARBA president. He charged that we are not even maintaining our old highways adequately, much less building an adequate mileage of new highways. The public demand exists and the national economy calls for an expanding and continuing highway program in most unmistakable terms, he declared.

State highway engineers from surrounding states were unanimous in asserting that funds available for highway construction at present are only half the amount needed to keep pace with demands and needs. Hal Hale, secretary of AASHO, pointed out that lack of engineering personnel in state highway departments is handicapping the road program. He advocated closer cooperation between highway officials and engineering colleges in interests of recruiting more technical graduates for the highway field.

Contractors, engineers and equipment manufacturers discussed the future of equipment development. More than 300 delegates attended.

CRANE USED AS DOZER—A mid-west manufacturer borrowed a Lorrain crane from his materials handling department, put a blade on it and used it to spread cinders over this parking field. The bulldozer blade is attached to the boom by chain for raising and lowering.

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Research group to survey modular coordination

The first project to be undertaken by the Building Research Advisory Board, National Research Council, will be a survey to determine why modular coordination of building materials, equipment and design has not yet found wider practical use, despite its extensive technical development (ENR Feb. 24, p. 9).

Modular coordination involves the use of multiples of a basic four-inch module in determining the dimensions of construction materials and features such as masonry, doors, windows, etc. Its use is intended to simplify standardization of building materials and equipment, and to reduce the cost of on-site construction.

The project is undertaken under a research contract from the Housing and Home Finance Agency which has been authorized by Congress to promote the wider use of standardized dimensions as a means of lowering the cost of housing.

Arthur D. Little, Inc., Cambridge, Mass., research and engineering organization, has been engaged by the board to obtain data on this subject and is seeking from the many industries, professions and trades affecting building, their comments and criticisms.

◆

Revamp road bureau for new program

Preparing to start a long-range program for developing its highway transport system, the State of Washington last week began a drastic reorganization of the administration of its highway program.

Measures signed recently by Gov. Arthur B. Langlie carry out a substantial number of recommendations made by the legislature's joint Fact-Finding Committee on Highways, Streets and Bridges, designed to get more results from the highway user's tax dollar. The legislature made its recommendations after a comprehensive report on the statewide engineering study prepared by the Automotive Safety Foundation, and a separate finance study by James C. Nelson, of Washington State College.

Under the program, the post of assistant director of highways is to be created, to integrate state aid to local units of government. Committees are to be required to adopt ten-year road construction programs and all counties are required to adopt uniform accounting and budgeting procedures.

The state will build and maintain routes through cities and will assist cities with grants for traffic studies.

The state gasoline tax was increased from 5 cents to 6½ cents, with 1¼ cents of the increase allocated to state highways, and ¼ cent to the counties. Gross weight fees for trucks and tractor trucks are higher than previous rates, although in nearly all cases less than recommended by the legislative committee.

◆

Lane vetoes bill to raise weight limit on Md. roads

Gov. W. Preston Lane of Maryland recently vetoed a bill which would have permitted a great increase in the maximum weight of truck loads on Maryland bridges and highways.

Regarding this measure, Governor Lane said: "This bill would change the formula for determining gross weight of motor vehicles permitted to operate on Maryland bridges and highways, in a manner which would allow vehicle-and-load capacities up to 90,000 pounds under existing maximum vehicle-length regulations.

"Neither the roads nor the bridges in Maryland have been designed to carry burdens of this tremendous weight in day-to-day traffic, representing as it does, a 22,500-pound increase in the maximum permitted weight under the present law."

◆

Announce $14.5 million roads program in Idaho

A $14,500,000 highway and bridge construction program was announced by the Idaho Bureau of Highways. Much of the work is scheduled to be completed this summer, with some construction involving federal aid, some being entirely state financed.

The program includes $889,000 in emergency relief projects occasioned by last spring's floods in northern Idaho on the North and South and Lewis and Clark highways.

Topping the bridge projects is a $1,500,000 span across the Clearwater River at Lewiston. Other bridge projects include a bridge and overpass on the St. Joe River at St. Maries to cost $235,000; a 1,000-ft. one-lane timber bridge over Snake River between Cassia and Minidoka counties to replace Jackson bridge, estimated at $100,000, and $120,000 in bridge repairs to three structures in Canyon, Owyhee and Camas counties.

In addition to contemplated construction, the state bureau of highways has under contract $4,273,000 in construction and repairs at the present time.

◆

States push highway jobs as season advances

This week, as the construction season advances, most state highway bureaus were pushing rapidly ahead with their construction and maintenance programs. State legislators, too, wrote new road provisions into these programs. Highlights were:

The state plans are being revised for the $10,000,000 East Boston, Mass., superhighway, the course of which must be shifted to prevent tearing down the A. C. Campbell Co. plant on Orleans Street, work stoppage at the plant, and resulting damages of $1,000,000. William F. Callahan, Commissioner of Public Works, ordered a change after conferring with members of the Boston Transit Department.

CALIFORNIA SINGLE LEAF BASCULE will cross the San Joaquin River on U. S. 50 near Tracy. The $665,000 bridge is two lanes wide and together with the existing bridge in the background will provide four-lane service. Contractor is Judson Pacific-Murphy Corp., Emeryville, Calif.

The State Roads Commission of Maryland also has a big program: it has already scheduled projects to cost $40,000,000 for this year, with more to come. Five major road projects are scheduled for the Eastern Shore of Maryland under the most extensive road construction program ever undertaken in the state for one year, it was announced at Centreville last week.

Rural roads are uppermost in the minds of road makers in North Carolina where the legislature has enacted into law a bill providing for a referendum, the date to be set by the governor on a proposal to issue $200 million in bonds for rural road construction, and to add one cent to the state gasoline tax. The legislature has also increased load limits for trucks on state highways. The measure retains the present limitation of 18,000 lb. per axle for trucks but allows an increase from 50,000 to 56,000 lb. for trucks with four or more axles and from 40,000 to 44,000 for those with three axles.

A 60-mi. road linking Atlin, in northern British Columbia, with the Alaska Highway will be built by the Canadian Army, as a result of negotiations between provincial Premier Byron Johnson and the federal authorities.

Other governmental actions on highways included these:

The Pennsylvania State Legislature unanimously passed legislation freeing the state's last 10 toll bridges. A $10,000,000 bond issue for state purchase of the bridges is included in the bill. They are located—two at Harrisburg, two at Bethlehem, and one each at Clarks Ferry, Charleroi-Monessen, Ellwood City, Sunbury, Point Marion and Allentown.

The Arkansas highway commission has completed the programming of $25,000,000 in highway construction. Upwards of $15,000,000 will be contracted for this year and the remainder for 1950.

The Kansas legislature ended its session's work recently with enactment of legislation to start a 20-year, $1.75-billion long-range highway program. It repealed a temporary 1-cent gasoline tax and added 2 cents to make the total tax 5 cents; increased passenger car and truck fees; and borrowed $5,000,000 from the general fund against anticipated highway revenue to permit a start on construction.

◆

Canada makes progress in postwar house building

Every twelfth Canadian now lives in a postwar house, according to statistics released by Central Mortgage and Housing Corporation in its quarterly review of the housing situation in Canada.

The review says that 1948 saw the completion of 81,000 housing units, the greatest yearly total in the history of the dominion.

During 1948, 95,000 housing units were started, an increase of 17 percent over 1947. New family formation, due to marriages and immigration, approximates 80,000 per year so that the current housing rate is just keeping pace with the demand for new housing.

John E. Armstrong

Canadian engineers meet; elect Armstrong president

The Engineering Institute of Canada recently held its 63rd annual meeting in Quebec. With a four-day program, the convention drew nearly a thousand delegates from the society's 10,000 membership.

Among many interesting construction jobs described by speakers was the all-aluminum arch bridge now under way at Arvida, Que. (ENR June 3, 1948, p. 3). C. J. Pincoff of the Dominion Bridge Co., Ltd. (cost-plus-fixed-fee contractors for design and erection of the arch) described unusual features of the job.

The bridge will cross the Saguenay River with a clear span of 290 ft. and a total length of 504 ft. with approach spans. The main span is a fixed arch consisting of two box girder ribs; the deck will be on continuous plate girders—a concrete slab roadway with bituminous wearing surface. All connections are riveted with specially devised cold rivets. An overhead "skyline" is used in erection after first sections have been cantilevered out from the abutments.

E. H. Gohier, chief engineer of the Quebec Department of Roads, told of problems met in construction of Chicoutimi highway, which runs north from Quebec to the Saguenay River (ENR Feb. 17, p. 74).

T. H. Hogg, consulting engineer and former chief engineer of the Ontario Hydro, was awarded the Sir John Kennedy Medal; R. W. Diamond, vice-president of Consolidated Mining and Smelting Co., of Trail, B. C., was awarded the Julian C. Smith Medal. These are the two leading medals of the institute given for outstanding service to Canada.

John E. Armstrong, chief engineer of the Canadian Pacific Railway Co., was elected president of the EIC for the forthcoming year. Vice-presidents are R. E. Haertz of Montreal, Alex Lariviere of Quebec, I. P. MacNab of Halifax, H. N. Macpherson of Vancouver, W. J. W. Reid of Hamilton and J. A. Vance of Woodstock, Ont. C. E. Sisson was recently appointed field secretary, to assist with the expanding work of the institute.

* * *

NW sewage group moves to certify plant operators

Certification of sewage works operators in Washington, Oregon, Idaho and British Columbia was made possible by a resolution passed by the Pacific Northwest Sewage Works Association at their annual conference held in Bellingham, Wash., recently.

Under terms of the resolution a five-man committee will be appointed for each state when and if certification is requested by the regulatory body in that state (Health Department or Pollution Control Commission). The entire program will be on a voluntary basis with no legal requirements that operators be certified.

Major emphasis in technical sessions was placed on problems of plant operators.

The Arthur S. Bedell award was presented to Carl E. Green, partner of J. C. Cunningham and Associates. New officers are: president, Emil C. Jensen, chief sanitary engineer, Washington Health Department; first vice-president, W. W. Tinniswood, acting head of civil engineering at the University of Idaho; and secretary-treasurer, William P. Hughes, city engineer, Lewiston, Idaho.

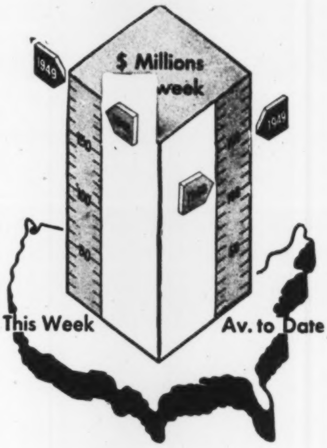
Regional pollution group formed

Representative pollution control groups of Washington, Oregon, Idaho, Montana, British Columbia, and Alaska met recently to form the Pollution Control Council—Pacific Northwest River Basin. This semi-official group will coordinate activities of member bodies in connection with the program under the Federal Pollution Control law.

Officers chosen were: Chairman—C. M. Everts, Jr., chief engineer, Oregon State Sanitary Authority; secretary—Regionald Bowering, public health engineer, British Columbia Provincial Board of Health; and treasurer—R. R. Harris, sanitary engineer, U. S. Public Health Service, Portland, Ore.

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost..	May '49	472.10	226.94
Building Cost	May '49	348.92	188.62
Volume	Apl. '49	268	118



Activity This Week

As reported to ENR
(in millions of dollars)

Amount of Contracts let

	Week of May 26 1949	Cumulative 1949 (21 wks.)	Cumulative 1948 (22 wks.)	Cumulative % chge av.wk.
Federal	$25.1	$433.9	$468.9	−3
State & Mun.	72.7	1,154.1	974.6	+24
Total Public	$97.8	$1,588.0	$1,443.5	+15
Total Private	95.8	1,485.8	1,293.5	+20
U. S. Total..	**$193.6**	**$3,073.8**	**$2,737.0**	**+18**

Contracts by type of work

	This Week	Cumulative 1949 (21 wks.)	Cumulative 1948 (22 wks.)	Cumulative % chge av.wk.
Waterworks.	$3.7	$65.1	$92.2	−26
Sewerage...	3.9	97.9	87.1	+18
Bridges	9.0	139.0	113.1	+29
Highways ..	26.6	293.2	385.3	−20
Earthwork, Waterways	14.1	253.1	245.1	+8
Buildings,				
Public ...	33.2	636.4	432.4	+54
Industrial.	13.1	397.9	400.8	+4
Commercial	71.1	954.2	799.4	+25
Unclassified.	18.9	237.1	181.6	+34

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

New capital for construction

	Cumulative 1949 (21 wks.)*	Cumulative 1948 (22 wks.)	Cumulative % chge av.wks.
NON-FEDERAL ..		$1,548.5	
Corporate Securities		848.0	
State and Municipal		700.0	
Total Capital......		**$1,548.5**	

*Not available.

AFL junks jurisdictional machinery

(Continued from p. 33)

gestions because it was watching to see what happens to the Taft-Hartley Law.

3. The Taft-Hartley Law gives employers certain rights in jurisdictional disputes and should participate in any jurisdictional decisions.

4. Builders may be discouraged from making commitments on new construction by threats of more jurisdictional strikes. This would unstabilize employment further.

Observers favorable to the board also pointed out that the quoted charges made by the labor unions—that contractors themselves were creating disputes—could be refuted by facts.

"Actually," one expert said, "the principal reason that so many cases have been brought by contractors is that the labor unions involved in jurisdictional disputes often don't want to bring cases before the board—on the theory that such action would imply that they were uncertain of their actual jurisdiction. Therefore, the contractor—who is trying to get a job completed—often brings the case as an impartial third party, to get some settlement made.

"Another point to be remembered," he continued, "is that the agreement does not specify which crafts are to do certain jobs in certain areas; it only provides that, where no specific assignment is made, the contractor shall use crafts for work according to local custom. This has forced contractors into making some decisions which labor has later attacked as creating disputes."

Unions' own plan

The AFL said it would set up another plan for settling its jurisdictional problems without contractor participation. Disputes would be decided by a board consisting of a representative of each of the unions involved and an impartial chairman. Dunlop will be asked to serve as chairman.

The building trades used a "National Board for Jurisdictional Awards" in the early 1920's. In the 1930's, decisions were rendered by referees John A. Lapp and Peter Eller. Until the present joint board was created as a result of the Taft-Hartley Law, jurisdictional decisions were rendered by William L. (Big Bill) Hutcheson, president of the carpenters' union, as national referee.

A voluntary joint plan set up by the unions and the contractors early in 1947 when Congress was considering legislation which became the Taft-Hartley Law never was put into effect. President Truman and the White House had been used as a springboard for announcing the plan.

There apparently is more behind the break up of the plan than the reason given. The IBEW's Dan Tracy opposed it from the beginning. Displeased with some decisions, the IBEW convention authorized Tracy to withdraw from participation in the plan if necessary to protect the union's interests (ENR Sept. 30, 1948, p. 39).

Tracy, Hutcheson and others didn't like the idea of having persons outside the AFL building trades deciding issues which they felt were the concern only of the unions.

Disputes on increase

Jurisdictional strikes jumped up sharply the first four months of this year. There were 91 of them, all in violation of the joint agreement not to strike. But it is pointed out that the number is smaller than occurred before the joint board was created. Also, the joint board was available to end them quickly. It would not handle any dispute while there was a stoppage.

Statistics could not be obtained as to the number of applications filed with the joint board for decision. Gray reported to the convention in November that there had been 52 of them. He did not indicate, however, how many had been filed by contractors.

The board had handed down only four new jurisdictional decisions. The last one, giving operation of gasoline-driven electric generators for welding to members of the operating engineers' union, was handed down Oct. 27.

Many other disputes have been settled, however, by joint board rulings that an existing agreement or recognized jurisdictional award applied to the work in question. The number could not be learned.

Depends on new law

The existence of the joint board, of course, stems from the Taft-Hartley Law. And what develops may depend on what happens to jurisdictional disputes in new legislation.

The Taft-Hartley Law made jurisdictional strikes an unfair labor practice and permitted them to be enjoined in court. It also provided that the NLRB decide any dispute if the unions themselves could not settle it.

The joint board was created so that jurisdictional disputes could be settled within the industry rather than let go to NLRB for decision by a government agency unfamiliar with the long history and intricacies of union jurisdictional problems.

NLRB has said, by its actions, that the decision of assigning work rests with the employer, unless it is in violation of a collective bargaining agreement.

Proposed amendments to Taft-Hartley, offered on both sides, would correct this feature of the law so that NLRB or an arbitrator appointed by it could decide the merits of a jurisdictional dispute. If they are adopted, the new procedure might serve as an acceptable substitute for the joint board providing the unions do not strike pending a decision. A weakness of the Administration's bill is that it does not provide any injunction or other device for keeping the work going while the dispute is being decided.

FOR MORE PIPE—Pacific States Cast Iron Pipe Co. addition at Provo, Utah, costing $3,500,000, was opened recently, giving firm a 100,000 ton annual capacity. Plant was engineered and constructed by McGraw Co., with S. A. Adam as resident engineer. Old facilities are shown at left. Some 140,000 sq. ft. of floor space were added.

Multi-Purpose Reservoirs Aid Downstream Water Supply

F. W. Kittrell
Chief, Stream Sanitation Section, Tennessee Valley Authority, Knoxville, Tenn.

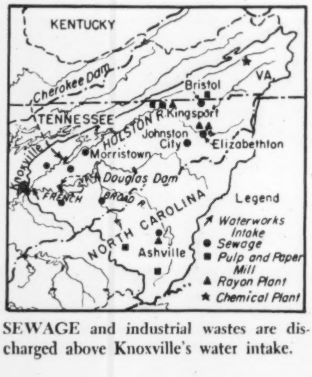
John J. Quinn
Filtration Chemist, Williams Creek Filtration Plant, Knoxville, Tenn.

How do multi-purpose reservoirs affect quality of downstream water supplies? What does their operation do to rates of discharge, temperature variations, bacteria, turbidity, color of water downstream? How do they affect chemical treatment—and costs?

Answers to these questions, and some others, are now available through a study of operating experience at the Williams Creek filtration plant at Knoxville, Tenn.

Analysis indicates that upstream impoundage improved river discharge, levelled out temperature variations and reduced turbidity, color, coliform organisms, alum and chlorine requirements and chemical costs. Alkalinity and hardness were not affected significantly.

The raw-water intake for the Williams Creek plant is located about three miles below confluence of the Holston and French Broad rivers in the upper end of Fort Loudoun Reservoir. Cherokee Dam, 55 miles upstream on the Holston, and Douglas Dam, 35 miles upstream on the French Broad, form the two large multi-purpose reservoirs that affect Knoxville's water supply.



SEWAGE and industrial wastes are discharged above Knoxville's water intake.

Pre-impoundage analyses of weekly samples collected near the mouths of the rivers reveal high mineral content in Holston River water (Table I). French Broad water, in contrast, is extremely low in minerals but high in turbidity and color.

Post-impoundage chemical and bacteriological analyses were made on samples taken twice weekly for one year from penstocks of both reservoirs as well as from the Holston River above Cherokee Reservoir. Results corroborated differences in turbidity, color, alkalinity and pH revealed by pre-impoundage tests (Table II). The coliform count of French Broad water was significantly higher than that of the Holston, but other constituents did not differ greatly in the two.

Results on the Holston above and below Cherokee Reservoir reveal some of the beneficial effects of impoundage on water quality. With the exception of alkalinity, which is unchanged averages of all reported constituents decreased with storage. Most striking reduction was a 97 percent decrease in coliform bacteria—an indicator of sewage pollution.

To evaluate effects of water storage, the chemical, bacterial and cost records of water plant operation for a pre-impoundage period of 1935-39 and a post-impoundage period of 1943-47 were selected for comparison. Periods as close together in time as practical were utilized, to minimize influence of changing watershed pollution.

Stream discharge

Average annual discharge of the Tennessee River at Knoxville was 12,900 cfs. for 1935-39 and 12,500 cfs. for 1943-49. These values compare favorably with the 12,800-cfs. mean annual discharge of record.

Comparison of average monthly discharges for the two periods (Fig. 3 on following page) shows that impoundage reduced fluctuation ranges and shifted the minimum discharge period from September to May. The higher minimum flows since impoundage probably improve water quality at Knoxville by greater dilution of pollution during low discharge.

Temperature reductions

Average annual temperature of treated water decreased from 63.4 deg. F. in 1935-39 to 59.3 deg. in 1943-47.

The details of temperature changes due to impoundage are shown in Fig. 4. The greatest reduction was in the warm months May to August with an average decrease of 10.5 deg. Peak water temperature was shifted from the late July (83 deg.) to early September (75 deg.). During November and December, water temperature averaged 11-deg. warmer after impoundage.

Reduced temperatures in warm months after impoundage are due to withdrawal of water through turbines from cold bottom strata. Late fall and early winter temperatures are higher after impoundage because stored water retains its summer heat, as atmospheric temperatures drop, longer than the formerly free-flowing streams.

Decreased temperatures have improved water for domestic consumption as well as for refrigeration purposes, but have increased cost of producing hot water and steam. In addition, they may have caused a slight increase in alum consumption for coagulation at the water plant.

Average annual turbidity dropped 61 percent, from 159 to 62 ppm. after impoundage.

Daily duration curves for the two periods show distribution of turbidity before and after impoundage (Fig. 5). Reductions occurred chiefly in higher turbidity ranges where greatest benefits to water treatment are realized through reduced alum consumption for coagulation. Marked reductions in lower ranges might be undesirable because a moderate amount of silt increases rate and effectiveness of sedimentation.

Changes in color

Average annual color decreased 36 percent from 22 to 14 ppm. after impoundage. In this connection, it should be noted that raw-water color at Knoxville is determined after passage through alundum filters. This

TABLE I—CHEMICALS CHARACTERISTICS OF HOLSTON AND FRENCH BROAD RIVERS BEFORE IMPOUNDAGE (TVA 1936–1937)

Constituent	Holston Average	Holston Maximum	Holston Minimum	French Broad Average	French Broad Maximum	French Broad Minimum
Silica (SiO_2)	6.2	9.	3.	8.6	14.	6.
Calcium (Ca)	53.2	116.	28.4	13.5	17.8	7.8
Magnesium (Mg)	9.1	14.2	4.2	2.7	5.3	0.6
Sodium Potassium (Na)	21.0	64.4	0.0	5.6	11.7	0.9
Sulfate (SO_4)	18.1	42.3	2.8	6.5	10.7	2.3
Nitrate (NO_3)	5.0	9.2	2.5	1.3	3.1	0.2
Chloride (Cl)	70.	266.	9.	6.	11.	2.
Alkalinity ($CaCO_3$)	94.	110.	68.	42.	66.	21.
Total Hardness ($CaCO_3$)	170.	330.	90.	45.	66.	22.
Non Carbonate Hardness ($CaCO_3$)	76.	254.	22.	3.	10.	0.
pH	7.8	8.4	7.4	7.3	7.6	6.9
Total Solids	390.	1,006.	187.	292.	1,358.	81.
Suspended Solids	85.	818.	1.	219.	1,286.	5.
Turbidity	70.	500.	5.	260.	1,500.	10.
Color	15.	50.	5.	50.	200.	20.

Results, with exception of pH, in parts per million.

TABLE II—SANITARY CHARACTERISTICS OF HOLSTON AND FRENCH BROAD RIVERS FOLLOWING IMPOUNDAGE AND EFFECTS OF STORAGE ON HOLSTON RIVER WATER. (TVA 1945–1946)

	Coliform Organisms MPN per 100 ml.	Temperature °C	5-day 20° C BOD ppm.	Color ppm.	Alkalinity ppm.	Carbon Dioxide ppm.	pH	Turbidity ppm.	Manganese ppm.
French Broad River—Douglas Penstock									
Average	165	15.8	1.01	63	40	6.5	6.9	46	0.09
Maximum	2,400	26.6	3.40	240	62	11.5	7.9	340	0.80
Minimum	2.6	3.0	0.24	15	20	2.0	6.5	13	0.0
Holston River—Cherokee Penstock									
Average	103	15.0	1.14	17	83	6.4	7.3	19	0.13
Maximum	1,600	25.2	2.45	60	93	13.0	7.6	110	0.62
Minimum	2.5	4.5	0.30	0	42	1.5	7.0	2	0.02
Holston River—Just above Cherokee Reservoir									
Average	3,470	16.8	2.58	24	83	—	7.5	41	0.15
Maximum	24,000	28.5	7.47	120	107	—	7.9	520	1.10
Minimum	52	1.0	0.68	1	22	—	6.4	5	0.01

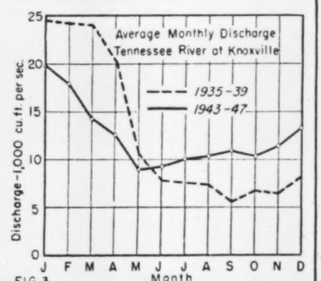


FIG. 3

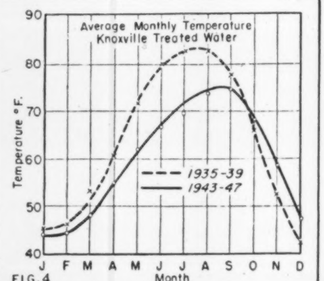


FIG. 4

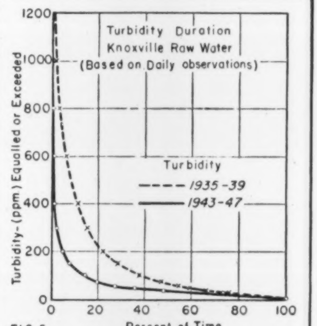


FIG. 5

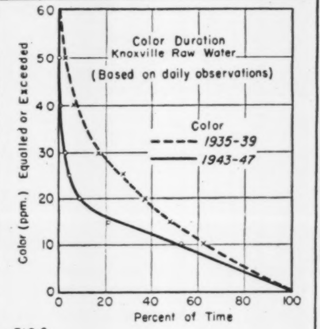


FIG. 6

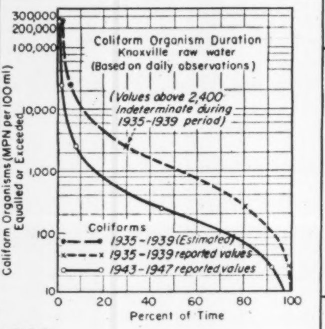


FIG. 7

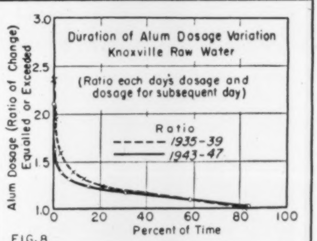


FIG. 8

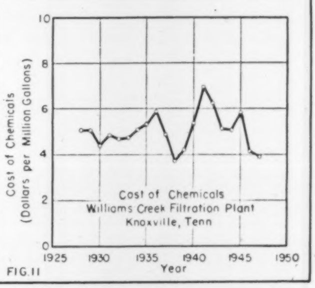


FIG. 11

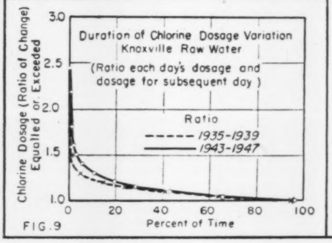


FIG. 9

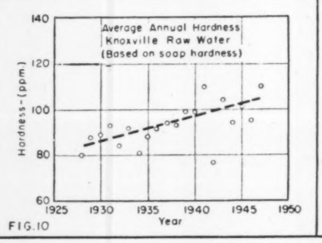


FIG. 10

STREAM DISCHARGE, water temperatures, turbidity, raw-water color, coliform-organism content, and alum dosage improved after impoundage. Chlorine "Ratio of change" increased (9) and cost of chemicals before and after impoundage are almost equal (11).

eliminates interference by turbidity but probably yields results lower than true values.

It is probable that not all color reduction should be attributed to impoundage. It is significant that the largest upstream paper mill has reduced wastes 65 percent since 1945.

Daily color-duration curves for the two periods of comparison (Fig. 6) reveal that the greatest reduction is in high color ranges where maximum saving in alum is obtained. The study revealed better correlation of alum requirements with color than with turbidity of the raw water since 1936.

Another benefit is realized in diminished color of treated water. When raw-water color at this plant is more than 100 ppm., finished water may exceed the acceptable limit of 20 ppm. Before impoundage, raw-water color exceeded 100 ppm. 0.2 percent of the time. Since impounded, it has not been more than 60 ppm.

Coliform organisms

The average annual most probable number of coliform organisms for 1943-47 was 5,500 per 100 milliliter. A comparable average for 1935-39 cannot be calculated. Coliform bacteria are estimated at the Knoxville plant from the confirmed test on a single tube of each of several decimal dilutions. Prior to 1940, dilutions were not high enough to assure negative tubes on highly contaminated samples. As a consequence about 30 percent of samples, with coliforms in excess of 2,400 MPN per 100 ml. yielded indeterminate results.

It was possible, however, to make a reasonable extrapolation of the duration curve of coliform organisms above the 2,400 value for 1935-39 (Fig. 7). Extrapolation is based on the assumption that the indeterminate portion of the 1935-39 curve has the same shape as the corresponding section of the 1943-47 graph, which is determinate and can be formulated.

Striking reduction in coliform organisms due to impoundage is revealed by the curves. An 80 percent decrease is recorded at the 50-percent time ordinate.

The U. S. Public Health Service suggests that coliforms should not exceed an average of 5,000 per 100 ml. for any month for treatment processes such as those employed at Knoxville. A single daily value of 240,000 per 100 ml. is occasionally reported in the raw water. Such a value alone causes the monthly average to exceed 5,000. An MPN of 240,000 or greater occurred about 2.0 percent of the time before but only 0.9 percent after impoundage.

Improvement in bacterial quality of Knoxville's raw water is due to reservoir barriers between the intake and sewage discharged by upstream communities, and possibly to additional dilution provided by increased stream discharges during low flows.

Alum requirements

Average annual alum dosage decreased eleven percent, from 1.98 to 1.76 grains per gallon, between comparison periods.

Several factors contributed to the reduction. Previously noted is the fact that alum dosage showed a marked correlation with color since 1936. Decrease in color due to reduced paper-wastes discharges and impoundage is undoubtedly reflected in lower alum needs. Decrease in turbidity following impoundage also contributed to this reduction. Adoption of breakpoint chlorination in 1943 may have been partly responsible. It is surprising that reduction in alum requirements has not been greater.

Control of stream discharge at the dams results in alternate preponderance of water from each of the two streams at the waterworks intake. This might be expected to cause rapid fluctuations in raw-water characteristics that would make control of alum dosage for effective coagulation difficult.

A "ratio of change" in daily alum dosage was obtained by calculating the ratio between each day's dosage and that for the succeeding day. The higher dosage in each case was divided by the smaller, regardless of order of occurrence. Duration curves of ratios of change before and after impoundage show a slight but definite reduction in alum-dosage fluctuations for about one-third of the time since impoundage (Fig. 8). The reservoirs apparently have levelled out variations in alum requirements that formerly occurred in free-flowing streams sufficiently to over-balance effects of alternate predominance of flow from dam control.

The slight reduction in variability

TABLE III — PRE- AND POST-IMPOUNDAGE COSTS OF CHEMICALS

Chemical	Actual Costs 1935–1939	Actual Costs 1943–1947	Adjusted Cost 1935–1939	Difference
Alum................	$64,680	$100,254	$112,800	$12,546
Chlorine..............	5,366	23,523	42,300	18,777
Lime................	6,315	16,175	15,900	−275
Total............	$76,461	$139,952	$171,000	$31,048

TABLE IV — SUMMARY OF CHANGES IN RAW WATER CHARACTERISTICS FOLLOWING IMPOUNDAGE

Item	Average Annual Values 1935–39	1943–47	Change Unit	Percent	Probable Major Causes of Change	Effects of Change
Stream Discharge (cfs.)..	12,900	12,500	−400	−3.1	Natural variations in rainfall and runoff	Not significant
Temperature (°F)......	63.4(a)	59.3(a)	−4.1(a)	−6.5(a)	Impoundage	Improvement for drinking & cooling. Expense of heating increased
Turbidity (ppm.)......	159	62	−97	−61	Impoundage & soil erosion control	Saving in cost of alum for water treatment
Color (ppm.)........	22	14	−8	−36	Impoundage & reduction of industrial wastes from pulp & paper mill	Saving in cost of alum for water treatment & reduced color of treated water
Alkalinity (ppm.).....	65	69	+4	+6.2	Natural variations in rainfall & runoff	Not significant except as it contributes to hardness
Hardness (ppm.)......	93	101	+8	+8.6	Increased industrial activity & natural variations in rainfall & runoff	Increased costs of soap & detergents, of commercial softening & steam production
Coliform Organisms—MPN per 100 ml.	1,050(b)	210(b)	−840(b)	−80(b)	Impoundage	Vastly improved sanitary quality of raw water indicating reduced effect of sewage pollution at intake
Alum Dosage (gpg.)...	1.98	1.76	−0.22	−11	Impoundage & reduction of waste from pulp & paper mill	Saving in cost of alum for water treatment
Chlorine Dosage(ppm.)	5.90(c)	3.28	−2.62(c)	−44(c)	Impoundage & reduction of waste from pulp & paper mill.	Saving in cost of chlorine for water treatment
Cost of Chemicals ($)...	34,200(d)	28,000	−6,200(d)	−18(d)	Impoundage & reduction of waste from pulp & paper mill	Increased economy of water treatment

(a) Results on treated water. Not available for raw water.

(b) From 50-percent time ordinate of duration curves of daily observations. Average annual value for 1935–39 indeterminate.

(c) Estimated values if breakpoint chlorination had been used before, as well as after impoundage.

(d) Estimated values assuming same type of treatment, quantity of water treated and unit cost of chemicals before impoundage as after impoundage.

of alum requirements has aided control of water coagulation.

Average annual chlorine dosage increased 76 percent, from 1.86 to 3.28 ppm. following impoundage. This increase is not a valid measure of impoundage effect because the water plant changed from simple to breakpoint chlorination at the start of post-impoundage. An estimate of probable breakpoint chlorine demand for 1935-39, based on plant records of simple chlorination, breakpoint chlorination and overlapping breakpoint laboratory data, indicates that pre-impoundage average annual breakpoint demand would have been about 5.90 ppm. of chlorine. This would give an estimated decrease in chlorine usage of 44 percent after impoundage and indicates a chlorine-cost saving probably due to impoundage and reduction of paper-waste pollution on the watershed.

Duration curves of ratio of change (Fig. 9) show that fluctuations in chlorine demand have been greater about one-third of the time since impoundage. This is contrary to data on alum dosages that indicate less fluctuation in alum requirements after impoundage. The difference in chlorine demands is probably greater than that in alum requirements of waters from the two tributaries. It is probable that alternate preponderance of water from the two streams contributed to increased variability in chlorine demand.

Breakpoint chlorination requires more accurate control than does simple chlorination to achieve a constant chlorine residual; this factor also probably contributed to the increased ratio of change in chlorine dosages. It is not possible to differentiate individual efforts of these two factors.

Slightly increased variability of chlorine demand since impoundage has increased difficulty of chlorination control.

Cost of chemicals

No radical changes in treatment have been necessary to meet changes in raw-water characteristics following impoundage. Cost of chemicals for water purification provides a reasonable index of the impact of impoundage on the treatment economy. Average annual cost per million gallons (Fig. 11) has not changed appreciably, being \$4.82 for 1935-39 and \$4.84 for 1943-47. No definite trend of change in cost since 1928 is apparent, despite rising chemical costs and adoption of improved treatment methods.

A more accurate evaluation of impoundage effects on cost requires that adjustments be made to compensate for changes in treatment. Actual costs for alum, chlorine and lime for the two periods and adjusted costs for 1935-39 to compensate for increases in quantity of water treated, unit costs of chemicals, breakpoint chlorination, and maintenance of a higher finished water pH for corrosion control during 1943-47 are shown in Table III. An attempt was made to allow for a slight saving in alum that probably has accompanied use of breakpoint chlorination, but no reliable basis for this adjustment was available.

The estimated saving of about \$30,000 for the five-year post-impoundage period, or an average of \$6,000 per year, can be attributed principally to improvements in raw-water quality, such as reduced color, turbidity, and chlorine demand attributable to impoundage and changes in industrial wastes.

Slight variation in alkalinity

Average annual alkalinity increased from 65 to 69 ppm. after impoundage. This 6.2-percent rise is not significant as similar variations occurred before impoundage.

High carbon-dioxide content of water in bottom strata of reservoirs might be expected to effect rapid solution of limestone, with marked increases in alkalinity and temporary hardness. This possibility is placed in proper perspective when it is realized that underground water in the vast watershed also is high in carbon dioxide and is in intimate contact with limestone in many areas which, combined, are infinitely larger than the bottoms of the reservoirs. Average alkalinities of water entering and leaving Cherokee Reservoir during a year (Table II) were identical.

Hardness increases

A trend of increasing hardness averaging about one ppm. per year since 1928 is found (Fig. 10). The increase between periods averaged 8 ppm. agreeing closely with the average rate of increase for the record period. This supports the probability that post-impoundage increase can be attributed partially to industrial activity on the watershed.

Any increase due to impoundage would be in bicarbonate hardness due to solution of limestone in reservoirs, accompanied by an equal increase in alkalinity. The increase of 4 ppm. in alkalinity noted above accounts for one-half of the estimated increase in hardness and is thought to be due to normal variations rather than to impoundage. The remaining 4 ppm. increase probably is due to industrial wastes.

No routine data on taste and odor are available, but the filtration chemist believes that taste and odor are less since impoundage. This opinion is supported by a reduction in consumer complaints. It is not possible to credit this improvement to a single cause since breakpoint chlorination was initiated with impoundage.

There is no evidence that algae production in the reservoirs has created a taste and odor problem. No prolific growths of algae have been observed in the reservoirs, and withdrawal of water from the bottom strata minimizes the downstream effect of algae growth that might occur in the surface stratum.

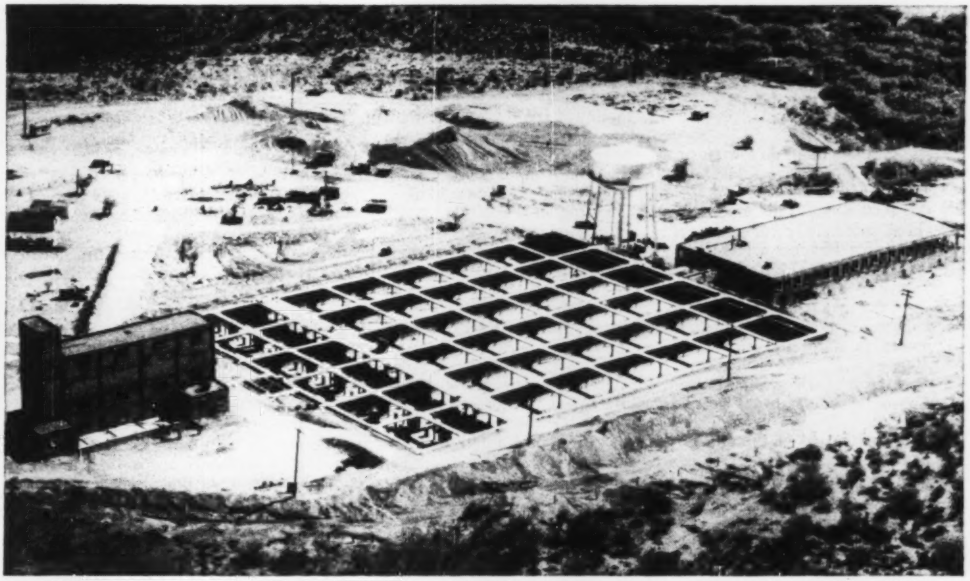
Manganese

Manganese strains appeared in the chlorinators and on the filter sand soon after impoundage. No data on manganese in the water supply were available before impoundage, and no comparison of manganese content for the two periods is possible. The best evidence of probable effects of impoundage is offered by the year's results on the Holston River above and below Cherokee Reservoir (Table II). The average for the water entering the reservoir was 0.15 ppm. compared to 0.13 ppm. in the water discharged from the dam, which means that there was no increase in manganese due to impoundage. Breakpoint chlorination was initiated a short time before the manganese stains appeared and the superior oxidizing capacity of free chlorine obtained through the breakpoint method may have precipitated the manganese normally present in the river and thereby called attention to a condition that had existed undetected previously.

Acknowledgments

The basic tabulations and computations necessary to organize the voluminous records of water plant operating data for this article were made by James H. Rhodes (deceased), Assistant Chemist, Williams Creek Filtration Plant, Knoxville Utilities Board, and Thomas D. Martin, biological aide, stream sanitation section, Tennessee Valley Authority. Mr. Rhodes utilized his intimate knowledge of the water plant and its operation to advance many suggestions that assisted in analysis and interpretation of the data.

Milo A. Churchill, public health engineer, stream sanitation section, Tennessee Valley Authority, assisted in establishing some of the statistical methods employed and in checking the manuscript.



PHOENIX WATER PLANT flow is under chemical building (left), into mixing and sedimentation tanks and through filters.

Varied Chemical Dosage Easy In New Phoenix Water Plant

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MAXIMUM flexibility of operation to cope with possible variations in the raw water is the key to designs of the West's newest water treatment plant, at Phoenix, Ariz.

Chemicals can be added to form a floc that will help settle out as much as 3,000 ppm. suspended solids and partially remove 220 ppm. hardness. Chlorine and activated carbon can be added as needed in the combined softening and filtration plant.

The 30 mgd. plant will be in full operation this year, in time for the high summer water demand. Its construction is part of a multi-million dollar water supply development program underway in Phoenix since 1946 (ENR Feb. 6, 1947, vol. p. 219).

Like most cities in arid regions, Phoenix has long been pressed to acquire an adequate water supply both for domestic and irrigation purposes. In the past, the domestic supply has come from a well field and infiltration gallery located on the Verde River 35 mi. to the east, augmented by wells located in and around the city. The Verde River well supply is of good quality for domestic use but limited in quantity, water from wells in and around the city is very hard—ranging up to 700 ppm. total hardness.

To develop an additional supply of water suitable for domestic purposes, it was necessary to locate the new water plant near the Verde River well field. Plant effluent as well as water from the well field (no treatment required) can thus be brought to Phoenix in the existing 48-in. pipeline. The new supply will be pumped from the Verde River, dams upstream (Bartlett and Horseshoe) regulating the flow. The plant site is just above the junction of the Verde and Salt rivers. The high salt content of the Salt makes it unsuitable for domestic use, but since the Verde River has its origin in the snow-covered mountains of northern Arizona, it is well adapted for domestic use. Carbonate hardness accounts for 200 ppm. of a total of about 220 ppm. hardness of this stream.

Flexibility of chemical dosage is insured by ample storage facilities for chemicals and by adequate chemical dosing mechanisms. All chemicals not manufactured at the plant will have to be trucked 26 mi. from the nearest railroad siding and stored in one of four 90-ton capacity storage bins.

Lime can be fed for softening purposes or to adjust the alkalinity for optimum flocculation conditions. Two gravimetric-type feeders of 1,500 lb. per hour capacity each are provided for this purpose.

Dosing for coagulation

For coagulation, alum, dry ferric sulphate, or liquid ferric sulphate can be applied. Two gravimetric-type alum feeders of 600 lb. per hr. capacity each are provided for dosing either alum or dry ferric sulphate.

Activated carbon will be used during periods when difficulty is encountered with algae. No provision has been made for removing the relatively low sulphate hardness.

Two chlorinators, one 1,000 lb. per day and the other 1,500 lb. per day capacity, are installed, with dosage facilities at the raw water effluent, sedimentation effluent or filter effluent.

Chemical made at plant

Ferric sulphate in liquid form is produced at the plant by the autoxidation process—a feature new to the field of water treatment. This process has been used successfully for a number of years at the Phoenix sewage treatment plant (ENR Oct. 14, 1948, p. 97), and preliminary laboratory tests indicate that it will considerably reduce the cost of chemicals used for coagulation in water treatment. The reduction in cost is possible because the process uses only scrap iron and sulphur—both comparatively cheap as raw material.

The essential parts of the autoxidation plant are a sulphur burner, conversion tanks and reduction tanks. The sulphur is melted and fed into a burner in a molten state. The resultant sulphur dioxide gas is piped to the conversion cell where it passes through large gas orifices submerged in a solution of ferrous sulphate. Air is compressed and introduced into the same conversion unit in a finely divided state. When all factors are controlled correctly, the product is ferric sulphate with a low acid content (less than 0.5 percent).

Part of this solution is then circulated through a tank containing scrap iron. The resulting ferrous solution is again circulated through the conversion cell, picking up more sulphur dioxide and oxygen to increase the amount of ferric sulphate. Part of the flow of ferric sulphate from the conversion cell is stored for use and the remaining portion is recirculated through the reduction tank to take more iron into solution.

Costs of ferric sulphate production at the sewage treatment plant indicate that it can be produced for about $20 per ton as equivalent anhydrous ferric sulphate. This is about half of the cost of the similar commercial product.

For coagulation, 20 ppm. of ferric sulphate together with 35 ppm. of lime has proven a satisfactory dosage under laboratory conditions. No difference has been noted in the results from use of the ferric sulphate produced by the autoxidation process and that obtained with commercial ferric sulphate. The inventor of the autoxidation process, Harmon E. Keyes, is supervising the autoxidation plant installation at the Phoenix water plant.

Submerged weir distributes flow

The difficult problem of equal distribution from the influent channel across the flocculation basins was handled by using an influent channel of level bottom and varying width. Submerged horizontal ports, 10 ft. long and 3 in. high, admit water to the basin. The flow is controlled by adjustable submerged weir plates that can be set at any position from fully closed to fully opened. If necessary, the plates can be set on an angle to secure proper distribution.

Shrinkage cracks and consequent leakage through the filter and sedimentation tank walls were eliminated by the use of vertical contraction and construction joints spaced 35 ft. apart. Copper Z-type water seals made these joints tight. This required the walls to be designed as vertical slabs spanning between the base slabs and the horizontal beams at the top that serve as walkways. Horizontal wall steel was broken at the contraction joints. The walls were allowed to take their normal shrinkage before the heavily reinforced horizontal beam at the top was poured. This method effectively eliminated shrinkage cracks even in the extreme heat of the desert sun.

The contractor on the construction of this plant was Del E. Webb Construction Co. and Arizona Sand & Rock Co., a joint venture, and the contract amount was $1,158,000.

R. G. Baker is city engineer of Phoenix. Dario Travaini is superintendent of the water plant, and of the sewage plant as well. The plant was designed by and construction supervised by Headman, Ferguson and Carollo, consulting engineers, Phoenix.

DESIGN AND ENGINEERING DATA FOR THE PHOENIX, ARIZONA, WATER TREATMENT PLANT

Treatment: Mechanical grit removal; chemical precipitation; flocculation; sedimentation; recarbonation; rapid sand filtration and chlorination.

Capacity: 30 mgd.

Raw Water Characteristics: Average hardness 220 ppm. of which 200 ppm. is carbonate hardness and 20 ppm. noncarbonate hardness. Average suspended solids is 300 ppm. with a maximum of 3,000 ppm.

Grit Removal: Two parallel basins each 13x40x5 ft. with bucket type grit collectors and elevators with storage hoppers. Capacity 30 tons per day each.

Chemical Handling and Storage: Bucket elevator to lift chemicals from truck unloading hopper to four, 90-ton, storage bins.

Chemicals: Lime, alum, activated carbon, ferric sulphate and chlorine.

Chemical Production and Application: Ferric sulphate produced on the site by autoxidation process and fed as a solution. Lime and alum fed through gravimetric type feeders. Activated carbon fed through a volumetric type feeder.

Flash Mixers: Two 10x10x8 ft. basins. Capacity 20 mgd. each.

Flocculation and Sedimentation: Three coagulation basins each 61x77x9.5 ft. and three sedimentation basins each 77x220x10 ft. Detention time 0.8 hours for flocculation and 3 hours for sedimentation. Mechanical, longitudinal type, flocculators. Continuous, straight-line, sludge removal.

Recarbonation: Carbon dioxide from oil furnace and gas washer. Applied after sedimentation.

Filters and Underdrains: Vitrified-pipe underdrain system with 6 in. of gravel and 27 in. filter sand. Three layers of gravel, each 2 in. deep, $\frac{5}{8}$ in. maximum to No. 10 minimum size. Filter sand effective size 0.5 mm. minimum; uniformity coefficient 1.68 maximum. Eight filters each 900 sq. ft. Filter rate 3 gal. per sq. ft. per min. max.

Backwashing: A 200,000-gal. elevated steel storage tank used for backwash head. Rotary filter-surface agitators used. Designed for 2.5 ft. per min. rise rate.

Meters and Controls: Flow controllers used on filter effluents automatically controlling filter-influent levels and proportioning flow among all filters by a pneumatic master-control system. Filter-effluent rate and loss-of-head indicators operated by pneumatic controls. Hydraulically operated valves controlled from filter-operating tables.

Gravity Flow: Gravity flow through entire plant and to City of Phoenix. Only pumping is backwash water and plant-service water.

Chlorination: Two chlorinators (1,000 lb. per 24 hrs. capacity and 1,500 lb. per 24 hrs. capacity) with dosage at raw-water influent, sedimentation effluent or filter effluent.

Economical Flexible Pavement Design

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Part III. Correlation of Bearing Tests

THE PRECEDING PARTS of this discussion of the results of extensive field studies of flexible pavements and bases on Canadian airfields were published in the issues of April 28 and May 12. They outlined the scope of the tests and summarized the test findings as they relate to flexible pavement design. This third part correlates the findings with other simple bearing tests and evaluates the plate bearing tests.

Four bearing tests studied

Plate bearing tests are costly and time-consuming, and the equipment is cumbersome to move from one project to another. Consequently, it was one objective of the Department of Transport's investigation to correlate other simple tests of subgrade bearing capacity with the results of the plate bearing tests. Four tests were selected for this purpose, the cone bearing, Housel penetrometer, California Bearing Ratio (field condition), and triaxial compression tests.

Figs. 23, 24, 25, and 26 demonstrate the relationships which have been established between plate-bearing tests versus cone-bearing[7], Housel-penetrometer[8], California Bearing Ratio (field condition unsoaked), and triaxial-compression tests, respectively, for the same test locations. The results for the four tests represent average values for 6-in. layers of subgrade over a depth of 24 in.

The representative lines through the data of Figs. 23, 24, 25, and 26 were established on the basis that the use of the cone-bearing, Housel-penetrometer, field-CBR or triaxial-compression test, respectively, must not overestimate the subgrade bearing capacity as measured by a 30-in. plate at 0.2-in. deflection, by more than 10 percent for any one airport, since materially overestimating the actual subgrade bearing capacity could lead to serious underdesign of the thickness of flexible pavements.

Table IV indicates for each airport, the deviation between the road test information obtained indirectly from the correlation curves for each of these four tests and the actual load test results determined by plate bearing tests. A percentage greater than 100 shows that for the test in question, the representative curve from Fig. 23, 24, 25 or 26, has overestimated the subgrade support for that airport by the amount of the difference between the percentage given and 100 percent. Similarly, the subgrade support indicated indirectly by the representative curve is less than the actual bearing value wherever the percentage shown in Table IV is less than 100 percent.

The data of Table IV are for cohesive subgrades under pavements at airports at which no special attempts were made to obtain high subgrade density by compaction during construction. It is possible that some compaction of the underlying subgrade had occurred as a result of aeroplane traffic on the runways over the years they had been in service.

In Table V, similar data are shown for Saskatoon Airport No. 2, where the top two feet of the clay loam subgrade were compacted to 95 percent of modified AASHO maximum density. Plate-bearing, cone-bearing, field-CBR, Housel-penetrometer, and triaxial-compression tests were made on the compacted subgrade, and on the underlying uncompacted clay material (natural state of compaction), the density of which was 85 percent of modified AASHO maximum. The information listed in Table V was obtained when the data for these five tests were plotted on Figs. 23, 24, 25, and 26.

From the overall average for each test listed in Table IV, it would appear that the graphs of Figs. 23, 24, 25, and 26, represent reasonable relationships for each of the four tests versus the plate bearing test. On the basis of these overall averages, the best relationship occurs for the triaxial test, followed in turn by the field-CBR, cone-bearing, and Housel-penetrometer tests.

On the other hand, for the different airports listed in Table IV, the data indicate that the use of these four tests individually and of the relationships of Figs. 23, 24, 25, and 26, may lead to underestimating the actual subgrade support, as measured by the plate bearing test, by as much as one-third, which however, is on the safe

TABLE IV—DEVIATIONS BETWEEN LOAD-TEST INFORMATION OBTAINED INDIRECTLY AND DATA OBTAINED BY ACTUAL PLATE-BEARING TESTS AT TEN AIRPORTS WITH COHESIVE SOILS.

(Ratio of load test values given by representative line through data for cone-bearing, Housel-penetrometer, field-CBR, and triaxial-compression tests, versus actual load-test values given by corresponding plate-bearing tests. Ratios expressed as percentages.)

AIRPORT	Cone bearing	Housel Penetr.	Field CBR	Triaxial comp.	Overall Average	Average of cone bearing and Housel penetr.
Ft. St. John	107.5	100.2	108.7	108.3	106.2	103.8
Grande Prairie	90.0	97.0	81.0	86.5	88.6	93.5
Calgary	87.2	65.6	108.0	98.0	89.7	76.4
Lethbridge	84.3	63.4	70.9	88.5	76.8	73.8
Saskatoon	96.5	98.1	99.8	91.6	96.8	96.5
Regina	73.0	86.8	94.6	109.1	90.9	79.9
Winnipeg	77.2	108.4	84.4	96.9	91.7	92.8
Toronto	103.5	92.9	85.0		93.8	98.2
Montreal	100.3	84.3	87.6		90.7	92.3
Moncton	107.2	99.2	110.0	97.6	103.5	103.2
AVERAGE	92.7	89.6	93.0	97.1	92.9	91.1

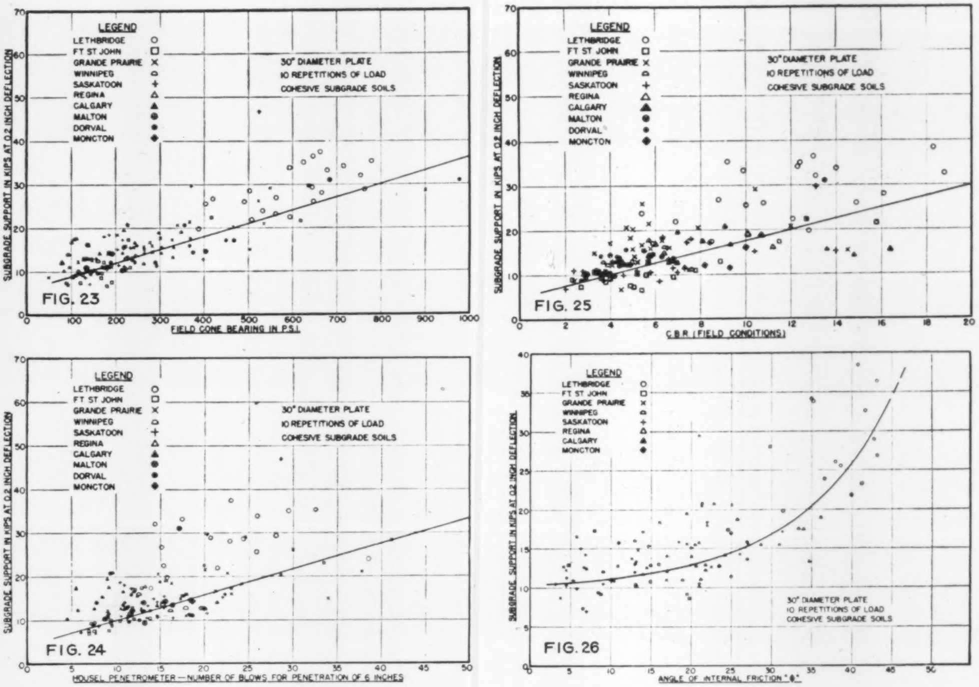


FIG. 23, 24, 25 & 26. **RELATIONSHIP** between plate bearing tests at the locations indicated and the cone bearing test, Housel penetrometer, California bearing ratio (CBR), and triaxial compression tests, respectively.

side for design. In no case is the subgrade support overestimated by more than 10 percent.

Similar conclusions can be drawn from the data for the compacted and uncompacted subgrade material listed in Table V, with the exception of those for the field-CBR test. The data of Table V for the CBR test, show that the use of the representative curve of Fig. 25 would underestimate the supporting value of the uncompacted subgrade by 14.8 percent, but would overestimate the supporting value of the compacted subgrade by 27.3 percent on the average. Insofar as the relatively limited data of Table V are concerned, therefore, it appears that the field-CBR test can indicate a considerably greater improvement in subgrade bearing capacity due to compaction than has actually occurred, (that is, the field-CBR values for the compacted subgrade may be abnormally high), and this could lead to serious underdesign, particularly for subgrade soils in the low CBR range.

This is apparently true also for the cone-bearing test, but to a somewhat smaller degree, and still less so for the Housel-penetrometer test, although for the subgrade to which the data of Table V pertain, the use of neither of these two tests would lead to underdesign, as would be the case for the field-CBR test. The data of Table V for the triaxial test indicate that the relationship of Fig. 26 between plate bearing and triaxial tests is consistent for both the compacted and uncompacted subgrade, the supporting value of each being underestimated by about 30 percent.

From the data for the four tests listed in Table IV and V it would appear that the triaxial compression test, when used in conjunction with the relationship of Fig. 26, might provide the most accurate indication of the supporting value of a cohesive subgrade, and more particularly if the increase in subgrade bearing capacity due to compaction to high density were required.

From the right hand column of Tables IV and V it can be seen that by averaging the plate bearing values obtained indirectly from cone bearing and from Housel-penetrometer data

TABLE V—DEVIATION BETWEEN LOAD-TEST INFORMATION OBTAINED INDIRECTLY AND ACTUAL PLATE-BEARING TESTS AT SASKATOON AIRPORT NO. 2 FOR COMPACTED AND UNCOMPACTED SUBGRADE.

(Ratio of load test values given indirectly by representative lines through data for cone-bearing, Housel-penetrometer, field-CBR, and triaxial-compression tests versus actual load-test values given by corresponding plate bearing tests. Ratios expressed as percentages.)

Saskatoon Airport No. 2, Subgrade Layer	Cone bearing	Housel penetr.	Field CBR	Triaxial comp.	Overall Average for four tests	Average for cone-bearing and Housel penetr.
Compacted........	102.1	84.1	127.3	65.9	96.8	93.1
Uncompacted......	66.1	67.5	85.2	72.4	70.3	66.8

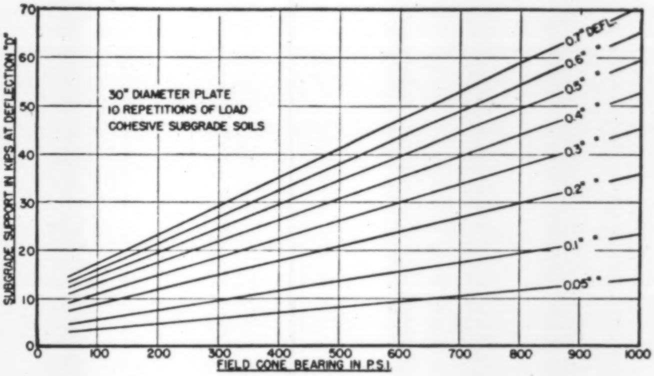


FIG. 27. GRAPH of the relationship of results obtained by the cone bearing test to those obtained with a 30-in. plate for deflection from 0.05 in. to 0.7 in.

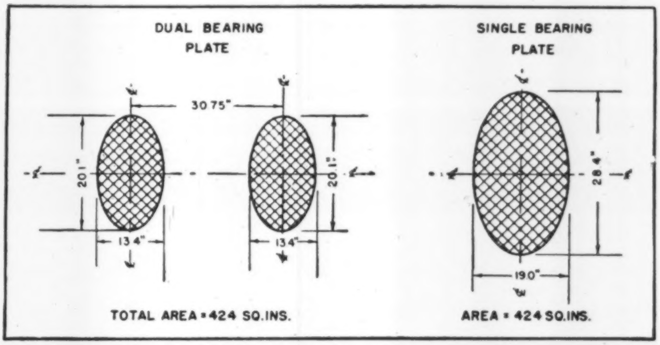


FIG. 28. DIAGRAM of elliptical steel plates employed for comparison of single versus dual bearing tests.

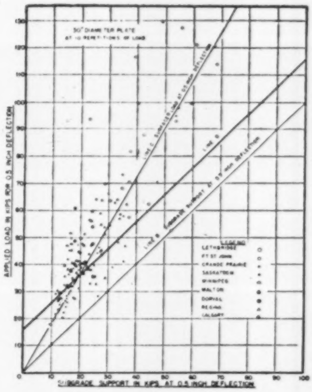


FIG. 29. APPLIED LOAD plotted against subgrade support at 0.5-in. deflection when the data had been corrected to apply to an overall thickness of 12 in. of base course and surface.

by means of Figs. 23 and 24, for subgrades that were compacted to high density and those that were not, average subgrade supporting values were determined that varied from underestimating the actual subgrade supporting value by 33.2 percent, to overestimating it by 3.8 percent.

From a comparison of the two right-hand columns in each of Table IV and V it will be observed that averaging the values for these two tests provides deviations from the actual subgrade support that are no greater, practically speaking, than the deviations obtained by averaging the values for the four tests. At seven out of 11 airports with cohesive subgrades tested up to this time, this method, based upon averaging the plate bearing values obtained indirectly from cone-bearing and from Housel-penetrometer data, has provided results that were within 10 percent of those determined by actual plate bearing tests, and at the other four airports it has underestimated the actual subgrade support by 20, 23, 25 and 33 percent, which however, is on the safe side for design. At no airport with a cohesive subgrade investigated so far, has this method led to overestimating the actual subgrade support by more than 10 percent.

The cone-bearing and Housel-penetrometer tests are easier and faster to make, and require much simpler equipment than the California Bearing Ratio test. However, even these two tests can be employed with reasonable accuracy for only fine textured cohesive soils that are relatively free from pebbles. Determination of the supporting value of stoney soils with the necessary degree of accuracy, would seem to require the use of the plate bearing test, since this test is able to integrate the contribution made by both the fine textured and stoney or pebbly fractions, over a contact area corresponding to that of a loaded tire.

Tables IV and V demonstrate that these four tests provide a reasonable measure of subgrade bearing capacity for the finer textured soils, when plate-bearing tests cannot be made. Of these, the triaxial appears to be the most reliable single test to employ, while the combined use of the cone-bearing and Housel-penetrometer tests is recommended for field determinations. It is important to remember however, that regardless of the nature of the test employed, the supporting value of the subgrade should always be determined for the worst condition of moisture content and density expected for it after the pavement has been laid.

Fig. 27 is a graph of cone-bearing versus subgrade plate-bearing test values for deflections from 0.05 to 0.7 in. for a 30-in. plate. It combines the information of Figs. 23 and 13. Similar charts can be easily prepared for Housel penetrometer, field CBR, and triaxial compression values versus the plate bearing test.

Standard test procedure requires that samples of the subgrade are to be soaked for four days before the CBR test is made. It should be emphasized that no relationship could be found between the results of subgrade plate bearing tests and the corresponding CBR values for soaked subgrade samples. The graph of Fig. 25 refers to plate bearing versus field-CBR (unsoaked) results.

Influence of dual tires

To investigate the influence of dual versus single wheels on runway design, a number of load tests were made with dual and single elliptical steel bearing

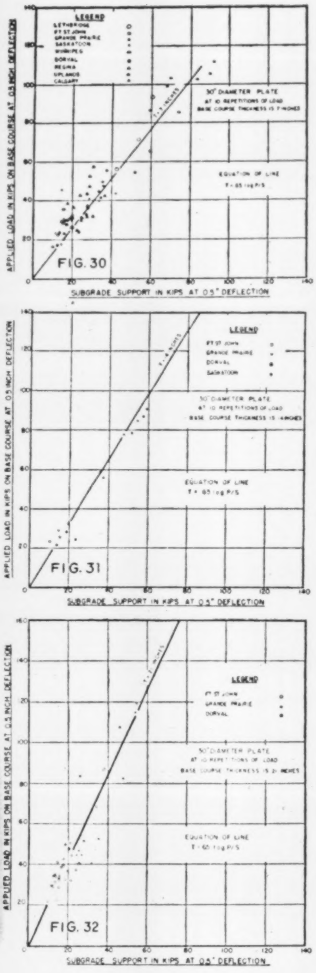


FIG. 30, 31 & 32. **GRAPHS** of applied load on the base course versus the subgrade support at 0.5-in. deflection for base course thicknesses of 7, 14 and 21 in.

plates having the same total contact area, Fig. 28. The spacing between the centre lines of the dual plates, 30.75 in. is identical with that for dual wheels on the four-engined North Star aeroplanes used by Trans-Canada Air Lines. The dual bearing plates were rigidly yoked together to function as a unit in a load test.

This series of tests indicates that at any given deflection between 0.2 and 0.5 in., dual bearing plates of this size and spacing carry about 33 percent more load than a single plate of the same contact area for a thickness of base and surface less than 10 in., and carry about 25 percent more load for a thickness of about 15 to 20 in. The difference in load carrying capacity between the single and dual plates appears to decrease as the total thickness of base and surface is increased, as would be expected on the basis of the elastic theory[8].

On the basis of the difference in P/A ratio for the single plate and for each half of the dual bearing plate, it can be calculated from Fig. 19 (Part II) that if the dual plates were spaced sufficiently far apart, so that the load on each half of the dual would have no influence on the other, the dual plates should carry about 40 percent more load than the single plate of the same overall area, for any given deflection between 0.2 and 0.5 in. Therefore, the ratios of 1.33 and 1.25 for thicknesses of about 10 in. and about 15 to 20 in., respectively, listed in the previous paragraph for the supporting value of dual versus single plates of the same contact area, indicate that because of insufficient spacing, the duals of Fig. 28 are only about 80 percent effective in distributing the wheel load for pavement thicknesses of about 10 in., and only about 60 percent effective for thicknesses of about 15 to 20 in.

Consequently, it seems evident that a much wider spacing of dual tires or of any other multiple tire arrangement must be specified, than is commonly utilized for under-carriage design at the present time, before the full saving in pavement thickness which is possible for multiple tires, can be incorporated into flexible pavement design for landing fields.

Evaluating plate bearing data for flexible pavement design

In Fig. 29 surface load versus subgrade support for a 30-in. bearing plate at 0.5-in. deflection for 10 repetitions has been plotted for each test location. The data were corrected on a basis of simple proportionality to apply to an overall thickness of 12 in. of base course and surface.

Line B of Fig. 29 indicates on either axis the load carried by the subgrade. Line Q represents a possible locus for the data on the basis that 12 in. of a given base course and surface increase the load carrying capacity of the runway or highway by exactly the same amount, regardless of the strength of the subgrade upon which it is placed. There is no tendency for the data to fall along Line Q or along any other line parallel to Line B. On the other hand, there is an unmistakable tendency for the data to fall along Line C, which passes through the origin.

The most notable conclusion to be drawn from Fig. 29 is that **the increase in overall load carrying capacity provided by any specified thickness of a given well-constructed flexible base and surface, varies directly with the supporting value of the subgrade upon which it is placed,** when the load supporting value of both subgrade and surface are measured at the same deflection with bearing plates of equal diameter. This means that the load supporting capacity of a given thickness of base and surface is halved when the subgrade support becomes only half as great, and doubles when the subgrade support is doubled.

This conclusion has been developed elsewhere[2], into a very simple equation for determining the required thickness of flexible pavements. The mathematical development is omitted here, but the resulting equation is

$$T = K \log (P/S) \qquad (1)$$

where

T = The required thickness of granular base in inches.

P = The gross wheel load in pounds to be carried on a runway or highway.

S = The total subgrade support in pounds, for the same contact area, number of repetitions of load, and deflection, that pertain to the applied load P.

K = The base course constant. Its value probably depends upon the composition, moisture content, and density of the base course material. For very large thicknesses its value must also depend upon the depth of base course.

The base course constant K represents an inverse measure of the supporting power of the base course per inch of thickness. It was pointed out earlier in connection with Fig. 22 that the supporting value per unit thickness of several different types of granular base courses appeared to be essentially the same on the basis of load test data obtained so far. It is for this reason that the term K in Equation (1), which is a constant for any one granular base course, appears to have the same value for all granular base courses as they are constructed at the present time.

To evaluate the base course constant K, graphs of applied load versus subgrade support, both on a 30-in. diameter bearing plate, were prepared for thicknesses of 7, 14 and 21 in. of granular base course, Figs. 30, 31 and

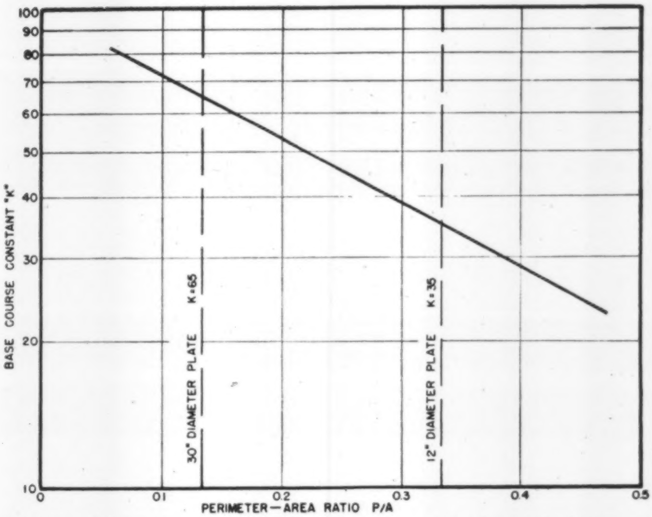


FIG. 33. INFLUENCE of the perimeter-area ratio on the value of the base-course constant *K* in the pavement design formula.

32 respectively. By trial and error it was found that the best straight line through the data of these figures represents a value of $K = 65$ for a 30-in. plate. Similar data give a value of $K = 35$ for a 12-in. bearing plate. From a study of all available data, it appears that the relationship between the value of *K* and the size of bearing plate can be expressed as a straight line when log *K* is plotted versus *P/A* ratio, Fig. 33.

In Fig. 30, data for Uplands airport at Ottawa, where the subgrade consists of about 80-ft. of relatively clean sand, are seen to be represented quite well by the best line through the data from other airports, where the subgrade consists of cohesive soil. Therefore, in the absence of more comprehensive data from a number of airports with sandy subgrades, it would appear that Equation (1) can be tentatively employed to determine the required thickness of granular base courses over subgrades of sandy soils.

Equation (1), $T = K \log (P/S)$, contains each of the factors that would be normally expected in a formula for flexible pavement design. *P* is the wheel load to be carried, while *S* is the supporting value of the subgrade for the same contact area, same deflection and same number of repetitions of load, that apply to *P*. The base course constant *K* is an inverse measure of the supporting value of the base course per inch of thickness. *T* is the total thickness of base course required to carry the applied wheel load *P*. In general, this would be the overall thickness of granular base course and bituminous surfacing employed, since the extra supporting value of the usual thin bituminous pavement (2 to 4 in. thick), would normally be disregarded or utilized as a safety factor.

Reduction in base thickness

Examination of Equation (1) indicates that the thickness of granular base course required for a given project can be reduced by one or the other of two methods. First by increasing the value of the subgrade support *S*. The most common methods available for this purpose are more adequate drainage, the use of selected soils for the top foot or two of the subgrade, and mechanical compaction. Second, by decreasing the value of the base course constant *K*, which means increasing the supporting value of the base course per inch of thickness. It is probable that compacting a granular base course to high density, and to at least 100 percent of modified AASHO maximum, would increase its supporting value per unit thickness well above that of granular base courses as they are normally constructed at the present time.

With regard to the second half of the problem of the supporting value of subgrades and base courses, which pertains to the supporting value of granular base courses per unit thickness, the following two fundamental items of information have been indicated by this investigation.

(1) For any given value of subgrade support, the supporting value of different types of granular base courses of any specified thickness appears to be the same, and is independent of variations in their composition. At least this seems to apply to base courses having the relative densities that result from average base course construction practice at the present time.

(2) The supporting value of a given thickness of a granular base course depends directly upon the supporting value of the subgrade upon which it is placed. It doubles when the subgrade support is doubled, and is halved if the subgrade support is reduced by one-half.

REFERENCES

7. Keith Boyd, "An Analysis of Wheel Load Limits as Related to Design", Proceedings Highway Research Board, Vol. 22 (1942).

8. W. S. Housel "Laboratory Manual of Soil Testing Procedures" Civil Engineering Department, University of Michigan (1939).

9. "Certain Requirements for Flexible Pavement Design for B-29 Planes", U. S. Corps of Engineers, U. S. Waterways Experiment Station, Vicksburg, Miss.

Part IV of this series of four articles will be published in the June 9 issue.

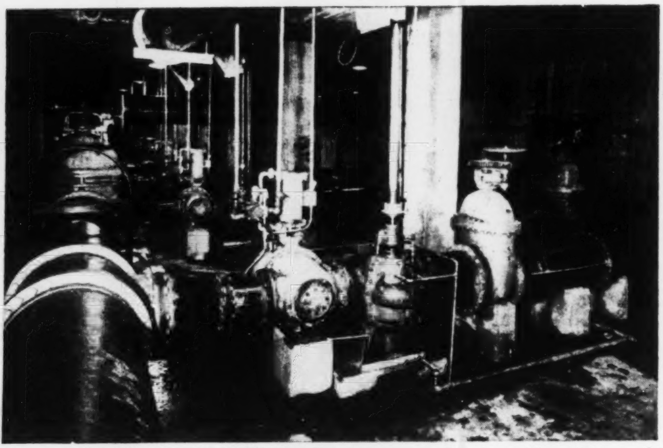
Roofing on the Ground Protects Houses

Roofing material unrolled on the soil under basementless houses—announced two years ago by the U. S. Department of Agriculture as a means of reducing moisture and preventing rot of floors and timbers—now proves to have other effects in preserving houses.

The department has recommended heavy roofing—55 lb. to 100 sq.ft., or heavier—and the method has been found desirable when adequate subfloor ventilation would interfere with the warmth of the house.

According to J. D. Diller, forest pathologist of the department's Plant Industry Station, evidence is accumulating that where the soil is covered, the air in the crawl spaces under houses is much drier. This means added protection against rusting of steel, deterioration of insulation materials, buckling of floors and short-circuiting of electric wiring. These other values, according to Mr. Diller, are byproducts of the successful efforts of the pathologists to make the wood in houses last longer.

Where the roll roofing is used, the generally recommended amount of ventilation can be cut down possibly as much as 90 percent, according to a recent recommendation of the Housing and Home Finance Agency, which has tested the method in a recent large-scale housing development.



WET ROOM, housing South District filtration pumps, dripping with moisture and dank with humid air, is converted into . . .

DRY CHAMBER by installation of dehydrating equipment as . . .

Chicago Dehumidifies Its Filter Plant

M. B. Ashmore
Filtration Designing Engineer
City of Chicago

WATER FILTRATION PLANT pipe galleries are generally unpleasant places, with dripping walls, sweating pipes and wet floors. Dampness and humidity damage protective coatings, weaken electrical insulation, corrode control equipment, handicap crews.

But Chicago plans to dehydrate the galleries at its huge (320-mgd.) South District filter plant, and already has installed pilot equipment that keeps a wash water pump room beautifully dry.

The pilot installation to provide data for designing gallery-drying units was set up in a 234,000-cu. ft. pump room, 20 ft. high and 25 ft. below grade. Tanks surround the pump room, so that the 12,750 sq. ft. of concrete walls are in contact with cold water. The room houses four 7,000-gpm. vertical centrifugal pumps and 475 lin. ft. of 12- to 42-in. cold water pipe that have an outside area totaling 4,700 sq. ft. There are also ten smaller motor-driven pumps and many small pipes and electric conduits.

A 5,000-cfm. dehydrating unit dries the pump room air by passing it through a spray of Kathene (a lithium chloride absorber) which removes the moisture. A circulating fan then discharges the dry air through four anemostats (diffusers) in a 210-ft. galvanized steel duct suspended from the ceiling.

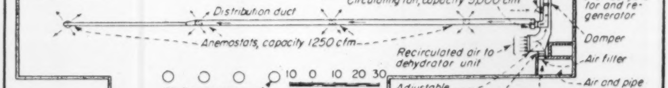
As much as 50 percent make-up air can be introduced from outside through damper arrangements, if necessary, positive pressure within the room may be maintained to limit infiltration and moisture penetration through walls. Warmed by steam-heated tempering coil when less than 60 deg., make-up air is dried in the dehydrator before discharge into the circulation duct. If no make-up air is used, recirculated air can be drawn through the dehydrator, or the machine can be by-passed entirely.

Humidity of the air is controlled manually, but a humidistat can be installed later. Although close control is not needed, operating costs will be at minimum if the air is dried no more than is required to prevent condensation.

The amount the air is dried is determined by the specific gravity and temperature of the lithium chloride in the dehydrator. When the chemical has been diluted to a predetermined point by absorbed moisture, it is heated automatically by a steam coil in a regenerator to drive off the water. Lithium chloride is more efficient when cool, so an automatically controlled cold water coil regulates its temperature. Waste humid air from the regenerator is discharged into a space beneath the plant.

It is expected that little lithium chloride will be lost during operation. Air filters keep dirt from the chemical; an inhibitor prevents lithium chloride corrosion. The inside of the waste duct has a protective coating against rust.

Maximum load on the dehydrator is expected in late spring or early summer, when the air is unusually warm and the water is cool. At such times the outside air may contain 100 grains of moisture per pound of dry air (14 cu. ft.). But under these conditions,


Air entrance register, normally closed, opened only when air is recirculated without dehydration
Air filter
Air supply to regenerator
Wet air discharge from regenerator
Dehydrating unit, consisting of air dehydrator and regenerator
Circulating fan, capacity 5,000 cfm
Distribution duct
Anemostats, capacity 1250 cfm
Damper
Recirculated air to dehydrator unit
Air filter
Wash water pumps
10 0 10 20 30
Scale, feet
Adjustable damper
Air and pipe shaft
Tempering coil
Makeup air intake

DEHYDRATED AIR enters the room at the rate of 5,000 cfm. It circulates, picking up moisture, then returns to be dried again.

the air leaving the dehydrator is guaranteed to contain no more than 32 grains of moisture, preventing condensation even if the water temperature is 40 deg.

The quantities of steam and water used are directly proportional to the amount of moisture removed from the air. Maximum amount of steam at 25 lb. gage when 50 percent make-up air is being used will not exceed 390 lb. per hr., and cooling water requirements will be no more than 42 gpm. at 40 deg. Two fans and one pump are required, each driven by a ¾-hp. motor.

Pump room dehydration started in January. The relative humidity in the room was 85 percent, and pipes and walls were dripping wet. Two days' operation reduced humidity to 60 percent, the pipes and walls were only damp, and water on the floor was evaporating. Humidity stabilized at 50 percent and the dry bulb temperature was 50 deg. The dried air leaving the machine had a humidity of less than 30 percent.

Pipes keep dry

Since that time it has been possible to keep the pipes and walls entirely dry. The regenerator has operated infrequently. In March, the machine was shut down intentionally for five days to see what would happen. The humidity increased from 46 to 63 percent in 12 hr. It continued to rise, slowly, and after five days it was 68 percent. By that time the pipes were dripping wet. With the dehydrator in operation again, humidity decreased to 56 percent after 2 hr. In 24 hr. the pipes were still damp in spots, but humidity had fallen to 54 percent.

The rapid increase in humidity in the first 2 hr. after shutdown indicates more load on the dehydrator than was expected. This may be partly due to moisture permeation through the concrete walls. It appears doubtful that air leaks alone could be the cause.

Further tests will be made to determine the effects of various damper settings under all conditions of temperature and humidity. Operation costs will be investigated.

The cost of the complete installation was about $20,000, which included some new doors and tile walls to block-off part of the pump room. The general contractor was Midwest Engineering and Equipment Co. of Chicago. Surface Combustion Corp., Toledo, furnished the dehydrating unit.

Oscar E. Hewitt is commissioner of public works of City of Chicago, and W. W. DeBerard is city engineer, under whose supervision the dehydrating system was developed and the installation carried out.

Notes on Legal Decisions

Summaries of decisions relating to construction prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill)

Damages Recoverable

An owner who has sustained injury by reason of a breach of contract may recover, either in an independent action or as a set-off or counterclaim in an action by the builder, all damages that are the approximate result of the breach. The owner, however, cannot recover any damages where the contractor is justified in abandoning the work.

The measure of damages is usually the cost of completing the work, unless the cost of completion is grossly out of proportion to the resulting good.[1] In such cases the measure of damages is usually the difference between the value of the building as built and its value if constructed in accordance with the contract.[2]

The recent case of Fleming v. Twine,[3] it was held that where there has been a "defective or unfinished construction the owner is entitled to judgment for the reasonable cost of completion in accordance with the contract, if this is possible, and does not involve unreasonable economic waste, and also judgment for the value of the loss of use, if the building was constructed for use. There can be no recovery, however, in the absence of an allegation and proof that the work done cost the owner more than the price he contracted to pay, or that he was damaged."

In this case the cost of completing the work was less than the amount remaining unpaid on the contract. The contractor sought to recover this balance. The court denied a recovery.

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(1) Jacob & Youngs v. Kent, 23p N.Y. 239, Elias v. Wright, 276 F. 908.
(2) Ciminelli et al. v. Unland Bros., Inc., 258 N.Y.S. 143.
(3) Fleming v. Twine, 58A. 2d 498.

Acceptance of Bid

To create a valid building and construction contract, there must be an offer or proposal and acceptance. The acceptance of the bid must be unconditional and without change in the terms of the offer. Where the tender is not responsive to the proposal, it is an offer by the contractor to do the work according to the terms of the bid and its acceptance by the owner creates a contract according to the terms of the bid.[1]

Where an offer specifies time, place and mode of acceptance, an acceptance after that time, or at any other place or in any other manner is ineffectual to form a contract.[2]

The acceptance, to conclude the agreement, must, in every respect, meet and correspond with the offer, neither falling short of or going beyond the terms proposed but exactly meeting them at all points and closing with them as they stand. There can be no variance from the terms of the offer and the acceptance must be complete without conditions.[3]

It is well settled that a proposal to accept, or an acceptance upon terms varying from those offered, is a rejection of the offer, and puts an end to the negotiation, unless the party who made the original offer renews it or assents to the modification suggested.[4]

Where no time is fixed in the offer, it expires at the end of a reasonable time. What constitutes a reasonable time depends largely on the nature of the particular offer and the circumstances of the case.[5]

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(1) 9 Corpus Juris, p. 696.
(2) Spratt v. Paramount Pictures, 178 Misc. 682, 35 N.Y.S. 2d 815.
(3) Barber-Greene Co. v. M. F. Dollard, Jr., Inc., 239 App. Div. 655, 269, N.Y.S. 211.
(4) Islen v. United States, 271 U.S. 136, 70 L.Ed. 872.
(5) 17 Corpus Juris Secundum, p. 399, 406.

Payment for Plans

An engineer who is employed to prepare plans for a project, in the absence of an agreement to the contrary, is entitled to compensation when the plans are completed, irrespective of whether or not the project is completed.[1]

Where it is agreed that the compensation is to be a certain percentage of the "estimated value" of the project, this term has been held to mean the estimated cost of the materials and services necessary to complete the structure. The defendant for whom the plans were prepared, contended that the term meant the value of the structure after it was completed, which was sustained by the trial court. The Appellate Court reversed this determination, holding that the engineer's fee could not be based on the value of a building that might never be erected, but rather on the estimated cost of completing the structure.

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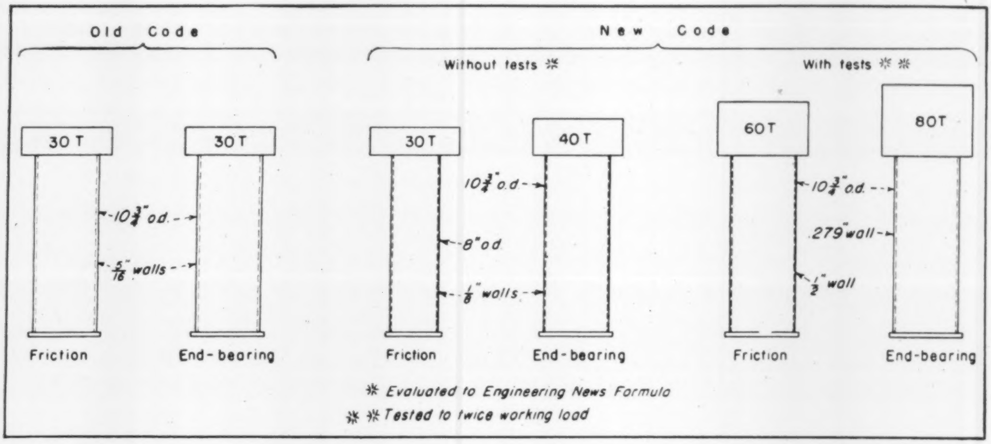
(1) Kuenzi v. Radloff, 34 N.W. 2d 798, (Supreme Court of Wisconsin, Nov. 16, 1948).



GREATER LOADS may be imposed on piles under new New York code. An example of possible saving as illustrated for one pile type—cast-in-place concrete, closed-end steel pipe. Working stress on concrete: 1000 psi.

New Pile Code Sets Load-Test Criteria

By J. H. Thornley,

President Western Foundation Corp., New York, N. Y.

NEW YORK CITY has just adopted a foundation piling code that embodies the modern principle of basing the working load allowance on load tests rather than on arbitrary formula or abstract theory. On the basis of load tests to prove higher bearing capacity of piles, foundation costs in many cases can be reduced more than one-fourth.

New York is the first large city of the country to adopt a pile-bearing code based on load tests. The pile revision also adds certain special provisions for investigation of soil by test pits and borings, and it contains revisions of allowable bearing capacities of soils. The new code represents two years' work by a committee made up of public officials, consulting engineers and construction men. Work included writing the code in a form applicable to field construction conditions, and securing its acceptance by public authorities.

Test loading of piles is not in any sense a new idea. It has been required by most codes for as long as codes have existed. The difference is that in the past test-loading was used as a check on the sufficiency of the pile to carry a preconceived, code-stipulated load, whereas the new idea is to use the tests in advance of the determination of the working load. Thus the maximum safe load may be known and used. The old idea was purely negative—the load test might reduce the working load to be allowed, it could not increase it. Such tests verify safety, but do not aid economy.

This principle of economy through pre-testing has been proved in other parts of the construction field. In concrete construction for example, test-controlled concrete has been allowed load on a basis of percentage of test load. And the load-by-test principle was the basis of load allowance for steel, almost from the inception of the use of steel as a building material.

There have been sound reasons for the slowness of the code writers in adopting the load-by-test principle for pile loading. The difficulties have arisen chiefly from the fact that soils to which or through which piles would be driven are rarely of uniform nature. In the New York code it required only a few short paragraphs to lay down the basic principles applying to the load-by-test method, but some 6,000 words were devoted to limiting requirements, hedging the use of the method against the dangers introduced by the element of nonuniformity of soils.

Some proposed codes are incautious

Several of the proposed new basic codes have been much less cautious in the use of the load-by-test principle. They seem to allow a percentage of the test load, limited only by the strength of the pile shaft considered as a short column, with the further requirement that no stratum of poor bearing value underlies the points of the piles. No final maximum load—regardless of test results—has been set, as has been done by the New York code. The danger of this too-generous allowance becomes evident when it is realized that a pile consisting of a 10-in. or 12-in. steel shaft, say 100 ft. long, driven to a sloping or irregular-surfaced and non-uniform rock, might be substituted for the usual 4-ft. dia. caisson carrying a million-pound working load. This might be done on the basis of testing one or two of these excess-load piles in an entire large structure. The test pile might have been perfectly plumb and have had a full end bearing on rock while later piles driven to the same hammer refusal might have been far out of plumb and have had only partial end bearing.

Obviously, major failures could result from such a practice.

Omitting the secondary (though vital) protective clauses, the skeleton on which the New York code is based can be stated rather briefly:

First. It has been accepted that the load-by-test basis cannot be economically applied to the smaller, low-cost structures, nor even to larger buildings where the time for starting the work is limited and where the delay of two to three weeks (which would be a minimum for the test program) cannot be permitted. To meet such situations the code sets up certain maximum loads based on use of the Engineering News formula and known to be safe for the New York territory because of extensive experience during the past 40 years or more. It would be well to underline "for the New York territory." The writers of the code had no faith in the Engineering News formula as a criterion to be applied under all soil conditions but they did believe that it had proved to be a safe rule of thumb when applied to most New York City soil conditions and when rigidly held to conservative top limits.

TABLE I—CLASSIFICATION OF SUPPORTING SOILS

Class	Material	Maximum Allowable Presumptive Bearing Values in Tons per Square Foot
1	Hard sound rock	60
2	Medium hard rock	40
3	Hardpan overlying rock	12
4	Compact gravel and boulder-gravel formations; very compact sandy gravel	10
5	Soft rock	8
6	Loose gravel and sandy gravel; compact sand and gravelly sand; very compact sand-inorganic salt soils	6
7	Hard dry consolidated clay	5
8	Loose coarse to medium sand; medium compact fine sand	4
9	Compact sand-clay soils	3
10	Loose fine sand; medium compact sand-inorganic silt soils	2
11	Firm or stiff clay	1.5
12	Loose saturated sand-clay soils; medium soft clay	1

Fordham and Ravenswood gneiss and trap are classed as hard rock. Inwood limestone, Manhattan schist and massive serpentine are medium hard. Shale, decomposed serpentine, schist or gneiss are classed as soft rock.

Second. The code committee made the assumption that piles embedded in soils of any bearing value—any soil which would not be classified as fluid in its undisturbed condition—will act as short columns regardless of actual overall length. This is in line with the assumption made by other proposed codes and by the pile foundation manual of the American Society of Civil Engineers.

It would seem to follow logically from this assumption, that all that would be necessary to establish the first governing factor for any pile, i.e., the strength of the shaft, would be to refer to the code allowances for short columns of the same material and type as the pile. However, this was not done, but an arbitrary set of bearing values for the more commonly used structurals—wood, concrete, steel and the like—was set up.

Having covered the first limiting factor for any pile load—the capacity of the shaft considered as a short or fully supported column—the code writers turned to the more controversial question of maximum loads to be allowed under a load-test program. With development of the load-by-test provision of the code, definite requirements were established for soil investigation by test pits or borings for any building area. Borings or test pits carried sufficiently into good bearing materials to establish its character and thickness are required in at least one location in every 2,500 sq. ft. of building area. For structures of more than one story (except two-story dwellings or for loading greater than 1,000 psf.) at least one boring in each 10,000 sq. ft. must be carried to 100 ft. below the curb or 25 ft. into continuous material as good as loose sand (Class 10 or better in Table I) or 5 ft. into ledge rock.

The test program

With this soil data in hand the test program is set up as follows: "Areas of similar soil conditions" are to be blocked out, covering the entire site. This "similarity" applies principally to the anticipated bearing stratum. For example, if it is expected that the piles will bring up by a combination of friction and end-bearing in a sand stratum overlying gravel to rock, "similarity" is not affected by the depths of the strata overlying this sand. The depth and continuity and uniformity of the sand as well as the underlying gravel strata are points to be studied as a guide to "similarity."

In each "area of similar conditions" three piles of the proposed type must be driven and a careful record kept of each. For piles with an average diameter or side of 8 in. or less, a hammer delivering a blow of at least 7,000-ft. lbs. is required, except that the minimum blow for a pile to carry 25 tons or more is 15,000-ft. lbs. For 8 to 18-in. piles a 15,000-ft. lb. hammer is required and for larger piles 22,000 ft. lb. is specified. The usual requirements of full-rated pressure, speed and stroke govern the use of double-acting hammers.

ENGINEERING NEWS FORMULA

(as specified in the New York City Code)

For drop hammers: $R = \dfrac{2WH}{S + 1}$

For single-acting hammers: $R = \dfrac{2WH}{S + 0.1}$

For double-acting hammers: $R = \dfrac{2E}{S + 0.1}$

Where:

R is the allowable pile load in pounds
W is the weight of striking part of hammer in pounds
H is the effective height of fall in feet
E is the actual energy delivered by hammer per blow in foot-pounds
S is the average net penetration in inches per blow for the last five blows after the pile has been driven to a depth where successive blows produce approximately equal net penetration.

The driving record of three piles is taken as an indication of the correctness of the assumption made as to the area similarity of the soil conditions. If the results of the test driving are too irregular or are for any reason unsatisfactory, the Building Department may require additional core borings or piles or both.

One pile load-tested

Assuming that the indications of similar conditions from borings and test driving are satisfactory, then one of the depth test piles in each "area of similar conditions" is to be load-tested. A test must be made on at least one pile for each 15,000 sq. ft. of building area and on a minimum of two piles for any project.

The test must be to twice the proposed load value of the pile, applied in seven increments equal to ½, ¾, 1, 1¼, 1½, 1¾ and 2 times the proposed working load. Readings of settlement and rebound must be recorded to 0.001 ft. for each change of load. Increment of load may be placed after there has been no settlement for two hours. The test load must remain in place until settlement does not exceed 0.001 ft. in 48 hours; then the load may be removed in decrements not exceeding one-quarter the total test load, at intervals of one hour.

The maximum working load allowable is the load that causes a net settlement of not more than 0.01 in. per ton of total test load or one-half the load that causes a gross settlement of 1 in., whichever is less. Net settlement is defined as the total settlement under

TABLE II—EXPLANATION OF TERMS COMPACTION RELATED TO SPOON BLOWS; SAND

Descriptive Term	Blows Foot	Remarks
Loose	15 or less	These figures approximate for medium sand, 2½-in. spoon, 300-lb. hammer, 18-in. fall. Coarser soil requires more blows, finer material, fewer blows.
Compact	16 to 50	
Very compact	50 or more	

Consistency Related to Spoon Blows; Mud, Clay, Etc.

Descriptive Term	Blows Foot	Remarks
Very soft	push to 2	Molded with relatively slight finger pressure.
Soft	3 to 10	
Stiff	11 to 30	Molded with substantial finger pressure; might be removed by spading.
Hard	30 or more	Not molded by fingers, or with extreme difficulty; might require picking for removal.

TABLE III—SOIL SIZES

Descriptive Term	Pass Sieve Number	Retained Sieve Number	Size Range
Clay	200	Hydrometer analysis	.006 mm.
Silt	200		.006 to .074 mm.
Fine sand	65	200	.074 to .208 mm.
Medium sand	28	65	.208 to .589 mm.
Coarse sand	8	28	.589 to 2.362 mm.
Gravel	....	8	2.362 mm.
Pebble	....	....	2.362 mm. to 2½"
Cobble	....	....	2½" to 6"
Boulder	....	....	6"

load minus the recovery or rebound of the pile after load is removed. Loads are further limited by specific provisions for different types of piles.

If the bearing material shown by the borings, test driving or load test indicates, in the opinion of the Building Department's engineers, that there is uncertainty that a group of piles will carry the group load indicated by the multiplication of the single pile test load allowance by the number of piles in the group the Department may order a load test up to 150 percent of the working load of the group.

Evaluation of bearing capacity

The test-load procedures outlined also are applicable to verification of the load-carrying ability of piles evaluated by driving formula. Within the limits noted below for specific materials, friction piles may be allowed a load of 30 tons if shown adequate by driving formula or up to 60 tons if proved by tests.

End-bearing piles of an acceptable type driven to rock, hardpan, or gravel-boulder formations directly overlying rock may be used for loads up to 40 tons on the basis of driving to formula requirements. If tested to double the design load they may be loaded to the permissible stress on the material but not to exceed 120 tons for piles bearing on rock or 80 tons for bearing on hardpan or gravel-boulder formations directly over rock. Higher loads are allowed on pipe piles driven open-ended to rock and on a concrete encased H-pile under special conditions.

With this opportunity to utilize the structural value of the pile, permissible stresses on materials and limiting sizes of types of piles becomes of utmost importance. Such limits are outlined below.

A few structural regulations affect all piles. These are: Piles may not be founded in material poorer than Class 12 (Table I) and must penetrate at least 10 ft. below cut-off. For friction piles the full load is to be assumed as distributed by the bottom two-thirds of the pile length so that the full bearing area required to support the load must be available above the upper third point. For end-bearing piles passing through material of Class 12 or better only 75 percent of the load need be assumed as carried at the tip for piles more than 40 ft. long. For shorter piles the full load is considered as carried at the tip. The portion of a pile that is free-standing in air or water is considered as a column fixed at a point 5 ft. below the soil contact level in Class 9 material or better, and 10 ft. below in poorer material.

Timber Piles: These piles are allowed 600 psi. on the net area of cedar, western hemlock, Norway pine, spruce and similar woods; 800 psi. is allowed on cypress, Douglas fir, hickory, oak, Southern pine and woods of comparable strength. But, the maximum load on a wood pile with a 6-in. tip is 20 tons and for an 8-in. tip is 25 tons. For temporary structures of a minor character over marsh lands, untreated wood piles having a minimum diameter of 4 in. at the point and 8 in. at the butt may be permitted under special conditions.

Untreated wood piles may be used if the top of the pile is below the permanent water table. Timber piles may extend above ground water if pressure treated with Grade 1 coal tar creosote oil meeting U. S. specification No. TT-W-571-b to a final retention of 12 lbs. of creosote per cubic foot of wood. Tops of the piles must be cut off below finished ground level and treated with three coats of hot creosote oil and capped with concrete.

Rolled Structural Steel Piles: These may be H-sections with flange projections not exceeding 14 times the minimum thickness of metal in web or flange and with a total flange width at least 85 percent of the depth of the section. No metal may be less than ⅜ in. thick. Other structural sections or combinations having flange width and depth of not less than 10 in. and thickness of metal not less than ½ in. are permissible. All steel must conform to ASTM designation A7 or A9.

Allowable stress on structural steel sections is 9,000 psi. Under special conditions of bearing on rock and being protected by two inches of concrete a compressive stress of 12,000 psi. may be allowed. To use the 12,000 psi. stress the code provides that the pile shall be installed by driving a casing containing a close-fitting temporary core in such a manner as to exclude foreign matter or by driving an open-ended casing that is cleaned to the bottom. The casing must be driven to rock or hardpan overlying rock, to a final penetration of not less than eight blows to the inch with a 22,000-ft. lb. hammer. Either the casing or a thin shell lowered inside the casing must be left permanently in the ground to contain the concrete used to encase the H pile.

The H section is placed and the shell or casing is filled with concrete and the H-section is driven immediately to refusal, on rock, before the concrete has set. Refusal is indicated by a rate of penetration of ¼ in. or less under the last five blows of the 22,000-ft. lb. hammer. Load value is allowable on the concrete but not on the encasing steel. Top loading for piles made under this section of the code is 100 tons without tests or 200 tons on the basis of tests.

Concrete Piles: Controlled concrete (where a specified compressive strength is maintained) is allowed one-fourth of the 28-day compressive stress but not to exceed 1,000 psi. Concrete consisting of one part cement to 5½ parts of aggregates and not more than 7½ gal. of water per sack of cement is allowed 500 psi. Concrete 1:4½ with 6¾ gal. is allowed 626 psi. Encasing steel is allowed 9,000 psi. load if it is at least ⅛ in. thick.

Cast-in-place concrete piles may be of uniform section or tapered and may be cased or uncased. If of uniform section they must be at least 8 in. dia. or, if not circular, have a minimum dimension of 7½ in. Tapered piles must be at least 6 in. dia. in any section and have an 8-in. dia. at cut-off. Tapered shoes or points may be used.

When placing concrete, the tube, shell or bore must be free of foreign matter and methods used that assure that the entire shell or bore is filled. The concrete cap cannot be placed until at least one hour after all piles within the cap group are completely filled.

Concrete-filled steel pipe or shells installed open-ended to rock, cleaned to the bottom and redriven until the piles bear securely on Class 1 or Class 2 rock may be loaded to as much as 200 tons. Steel thickness of 0.3 in. or more is required for the pipe or shell and stress is limited to 9,000 psi. for steel and to 1,000 psi. for concrete. The working load is limited to 80 percent of the value determined by material stresses, unless greater safe loads are proved by testing to double the proposed working load.

Precast concrete piles are required to have longitudinal reinforcing equal to at least 2 percent of the volume of concrete. Lateral reinforcing, in the form of hooks or spirals is required to be at least ¼-in. round rods or wires spaced 12 in. on centers throughout the length of the pile except at the bottom and top 3 ft. where this spacing must be reduced to not more than 3 in. Reinforcing steel must be covered with at least 2 in. of concrete. For precast concrete piles only, reinforcing up to 4 percent of the concrete area is allowed a modular ratio of 30,000 divided by the compressive strength (not the working load) of the concrete. For 500 psi. this ratio is 15 and for 626 psi. the ratio is 12.

Combination or composite piles may consist of two types joined for greater length or for better resistance to deterioration of the upper section and so constructed as to prevent separation of the sections during construction and thereafter. The maximum permissible load on such a pile is that allowed for the weaker section.

Organizations and Representatives on the Committee to revise the Building Code of New York City

American Society of Civil Engineers—R. E. Bakenhus and D. M. Burmister.

New York State Society of Professional Engineers—Emil Praeger and Jacob Feld.

Structural Engineers Society of New York—Howard Snyder and A. L. Stevenson.

National Lumber Manufacturers Association—Frank Alcott.

Portland Cement Association—John J. Hogan.

American Iron and Steel Institute—B. L. Wood.

General Contractors Association (of New York)—Robert Leslie Briggs, pile consultant; John W. Taussig, Raymond Concrete Pile Co.; J. H. Thornley, Western Foundation Corporation.

The committee was headed by Hugh Quinn, Councilmen from the Borough of Queens, Chairman of the Committee on Buildings. G. H. McCaffrey of the Commerce and Industry Association of New York acted as secretary. T. V. Burke represented the Department of Housing and Buildings of New York.

In addition to driving, piles may be installed by jacking or other methods without impact. Within the limits imposed on materials and types, the carrying capacity of piles jacked to position may not be more than half the force required to install them. The actual capacity must be proved by load test.

For underpinning piles, the temporary working load may not exceed the force required to install the pile. The working load of permanent underpinning piles may be as much as two-thirds of the jacking pressure required to secure the penetration if the load is held constant for ten hours; otherwise the load may be one-half of the total load for penetration, provided the limitations stipulated on materials and types are not exceeded.

Minimum spacing

Piles in groups must be spaced a minimum of twice the diameter or 1.75 times the diagonal of the pile. This cannot be less than 24 in. for piles bearing on rock and must be at least 30 in. for other piles. Piles in groups, or abutting groups, founded on materials below Class 6 (Table I) must have their spacing increased above the minimum values by ten percent for each interior pile up to a maximum of 40 percent.

A few additional important points of the code can be briefed as follows: Piles left in place from demolished structures may be used only if evidence of their length, driving conditions and load carrying ability can be produced. . . . Where additional piles are required, new piles must be similar to the old and each will be allowed only 75 percent of the usual load. . . . Tops of piles are to be embedded not less than 3 in. and the cap must extend 4 in. outside the piles. . . . Piles must be laterally braced, three or more piles in a cap qualifies. . . . Lateral loads in excess of 1,000 lb. per pile are not permitted unless it has been proved by test to twice the proposed load that movement will not exceed ½ in. and that under the working load movement will not be more than 3/16 in. . . . Soil under the pile cap is not allowed vertical load. . . . A tolerance of 3 in. from design location is allowed. . . . If piles are out of plumb more than two percent of the pile length the design must be modified. . . . Jetting may be done only with special permission, and jetted pile must be driven for final 3 ft. . . . Splices must be avoided as far as practicable. . . . Splices that cannot be inspected after driving must develop at least 50 percent of pile value in bending.

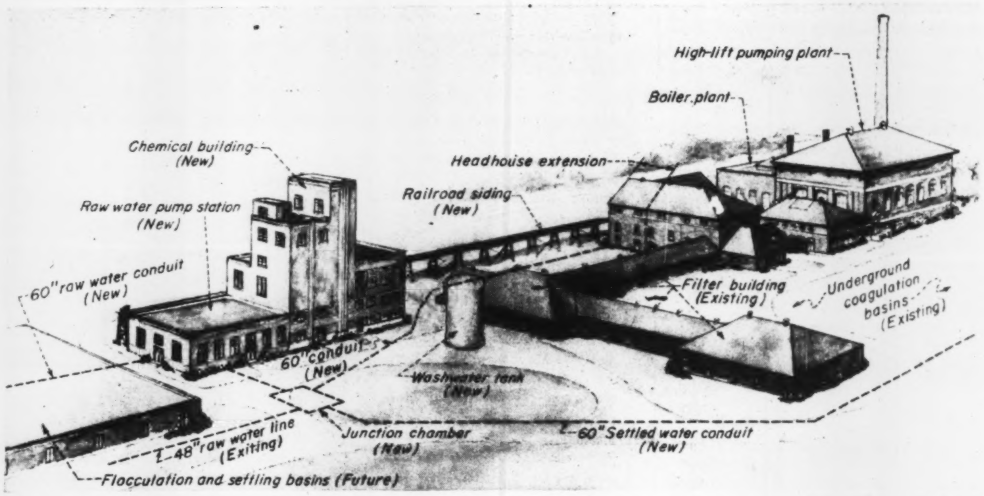
Note: Copies of the new code and of this article may be obtained gratis from the author at No. 2 Park Ave., New York, N. Y.

Conn. Sprays Trees from Air

Helicopters are being utilized by the State of Connecticut to spray elm trees along state highways. The American Public Works Association reports that this is being done to combat the European bark beetle which spreads the Dutch elm disease.

Tests have been made with three types of spray to determine the degree of beetle control possible with a given application of spray and also the length of time that the spray remains effective. The U. S. Department of Agriculture is working with the state highway department and the state agricultural experiment station in the tests.

Trees treated ranged from 85 to 95 ft. in height above the highway, with crowns spreading between 150 and 175 ft. Helicopters appear to be an answer to the problem of how to reach high points with spray.


High-lift pumping plant
Boiler plant
Chemical building (New)
Headhouse extension
Raw water pump station (New)
Railroad siding (New)
60" raw water conduit (New)
Filter building (Existing)
Underground coagulation basins (Existing)
60" conduit (New)
Washwater tank (New)
Junction chamber (New)
48" raw water line (Exiting)
60" Settled water conduit (New)
Flocculation and settling basins (Future)

EXISTING FILTERS will serve, with increased pretreatment, but new equipment is needed in the boiler and pumping plants, together with a seven-story chemical building and a new raw water pumping station.

Modernizing a 34-Year Old Filter Plant

AKRON, OHIO, will have enough purified water for its needs during the next 20 years, after it completes rehabilitation and expansion of its 34-year old steam-operated filtration and pumping plant.

The city will save money, too, when the work is finished some time next year. Consideration of an entirely new plant was abandoned in favor of the current program, when it was found that many units in the old plant still operate efficiently.

Akron has a water supply that can be developed to a maximum of 100 mgd. It gets its water principally from Lake Rockwell, formed by the Cuyahoga River Dam about 12 min. northeast of the city. The water treatment plant is located about 3,000 ft. below the dam.

The existing plant contains twenty-five rapid sand filter units, each of 2-mgd. normal-rated capacity. Existing settling basin capacity of 3.5 mg. will furnish a detention period of 1 hr. 40 min. for 50 mgd. of treated water. The filtered water is pumped to Akron through two 12-mi. lengths of parallel force mains, involving a static lift of 160 ft., and total lift of over 200 ft. One main is 36 in. and the other is 48 in. Both have been cement lined during the past ten years.

The plant was placed in operation in 1915. Additional filters were installed in 1917 and 1921. Except for increases in settling basin capacity in 1925, the addition of a high-lift pumping unit in 1933 and a short length of 72-in. paralleling raw water conduit in 1935, no major improvements have been made to the plant during the past 28 years. The plant has successfully met all demands for treated water, including a 52-percent increase during the war, although it is currently operating at the peak of its overall capacity with scant reserve for safety.

Prior to the war, a second intake was built at Lake Rockwell and 960 ft. of 72-in. concrete pipe was laid paralleling the existing conduit, with a cross-connection between the two lines. Under the present program, a 60-in. concrete pipe has been installed between the end of the 72-in. line and the treatment plant, and cross-connected at the plant.

Pumping station equipment

Both raw water conduits—the old 48-in. line and the new 60-in. line—discharge through meters into a well in the substructure of the raw-water pumping station. This substructure houses two screen wells, low-lift pump-suction wells and two rapid-mixing chambers. Five new raw-water pumps will be vertical motor-driven propeller type.

During normal lake level the two raw-water conduits feed by gravity directly into the filtration plant. During low water, they discharge into the raw-water, or low-lift, pumping station, to be boosted into the plant. This low-water period varies from a minimum of a few days to a maximum of one month each year.

Improvements to raise efficiency

The improvement program will produce a modern plant of balanced design and efficient operation, for a rated output of 50 mgd. (with a possible increase to 60 mgd.) Maximum pumpage now reaches 44 mgd. but the average is about 34 mgd.

Several features of the old plant (designed for an 18-mgd. capacity), will remain intact in the new; others are being modernized and increased in capacity; and some inadequate and obsolete units are being replaced with efficient faculties.

Major new equipment includes: two steam generators of 40,000 lb. per hr. capacity each; a 20-mgd. steam-turbine-driven pump, two 500-kw. generators with necessary switchgears and electrical controls. The outmoded low-capacity head house, which has served as a chemical building and the control center of the purification process, will be remodeled and a new chemical building will be constructed. A three-story extension to the head house will contain a machine shop, stockroom, locker room and warehouse.

A new clear-water suction well with suitable conduits will supplement an existing inadequate suction well—one of the bottlenecks for efficient plant operation.

Additional 60-in. settled-water conduits will be installed between settling basins and filters to increase plant efficiency and permit more flexible operation.

Boiler plant improvements

Modification of the boiler and pumping plants presents the greatest problems, since the plant must be kept in continuous operation. The existing low-lift pumps must be removed first to make room for installing the first boiler.

Each boiler is designed to produce 40,000 lb. of steam per hour at 465 psi. and 755 deg. F. The new turbines and pumps will operate under 450 psi. as compared with 195 psi. for the existing equipment. (Installation of the first new boiler will give sufficient capacity to operate the plant—the second boiler is for 100-percent standby capacity.) After the first boiler is installed, two of the four existing boilers and stokers will be removed to make room for installing the second boiler.

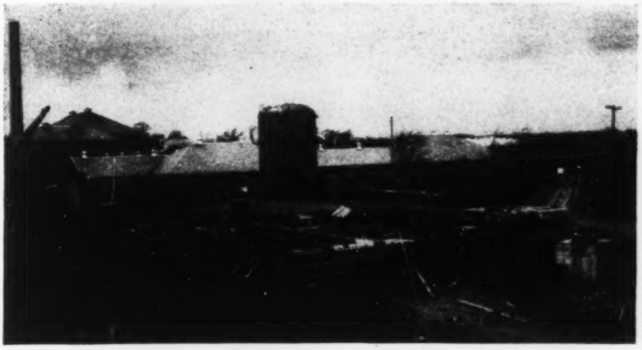
Coal will be delivered in bottom-dump hopper cars operating on the new railroad trestle. It will be dumped into a concrete coal pocket and charged into suspended steel bins in the boiler room by a new locomotive crane and clamshell.

Materials-handling equipment

The new chemical building will be seven stories high; the extra height being needed for housing the head of a vacuum-conveyor system for handling and storing bulk chemicals. The main portion of the building will be 80x45 ft., with a single story extension for the raw water pumping plant. Five reinforced concrete bins in the central tower portion of the building will hold 600 tons of dry chemicals—a month's supply at maximum rate of treatment.

Bulk alum and lime will arrive by rail and be charged into the bins by vacuum and screw conveyors. Liquid chlorine in one-ton containers, will be unloaded and stored on the third floor of the chemical building, which is at the level of the new railroad trestle. Activated carbon will be delivered in paper bags and stored on the second floor. The ground floor will be devoted entirely to equipment for the measured feeding of chemicals to the water.

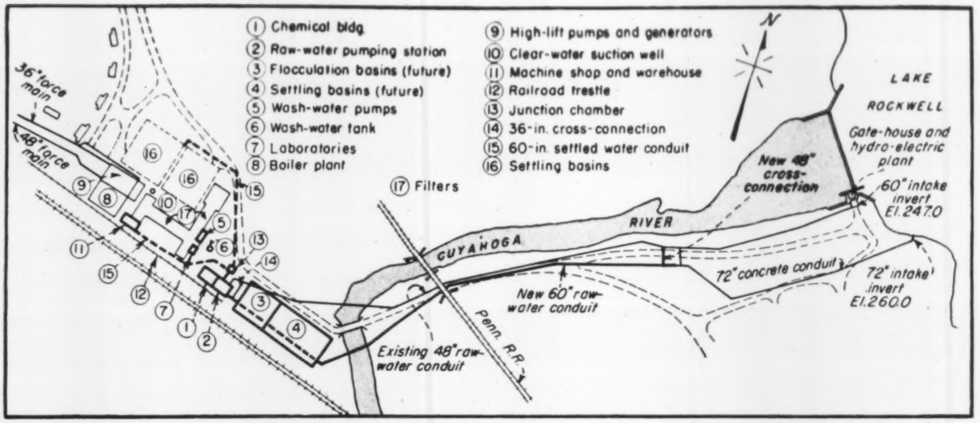
A new wash water tank has been completed, and each filter unit will be



RAW WATER pumping station (foreground) rises slowly above ground, while wash-water tank nears completion.

AKRON SPENT three years accumulating this stock of 17,000 ft. of 24-in. cast iron pipe for extension of its feeder mains.

INSTALLATION of the cast iron distribution mains proceeds rapidly, with excavation and pipe-laying by a rubber-tired crane, and backfilling by front-end tractor scoop.


① Chemical bldg.
② Raw-water pumping station
③ Flocculation basins (future)
④ Settling basins (future)
⑤ Wash-water pumps
⑥ Wash-water tank
⑦ Laboratories
⑧ Boiler plant
⑨ High-lift pumps and generators
⑩ Clear-water suction well
⑪ Machine shop and warehouse
⑫ Railroad trestle
⑬ Junction chamber
⑭ 36-in. cross-connection
⑮ 60-in. settled water conduit
⑯ Settling basins
⑰ Filters
36" force main
48" force main
N
LAKE ROCKWELL
Gate-house and hydro-electric plant
New 48" cross-connection
60" intake invert El. 247.0
RIVER
CUYAHOGA
72" concrete conduit
72" intake invert El. 260.0
New 60" raw-water conduit
Existing 48" raw-water conduit
Penn. R.R.

ADEQUATE RAW WATER supply is assured by a second conduit from Lake Rockwell to the filtration plant. Filtered water is pumped 12 mi. to Akron, through two force mains.

equipped with surface-washing agitators. Space is to be provided in the enlarged plant for a laboratory, operator's office, and washrooms.

The plant's five existing high-lift pumps will remain in operation. Two are vertical triple-expansion-engine type of 13 mgd. and 17 mgd. capacity, respectively, installed in 1915. One is a 10-mgd. steam-driven centrifugal, installed in 1920. These three pumps may be run by high-pressure steam, using pressure-reducers and de-superheaters.

TABLE OF CONSTRUCTION UNITS—COMPLETED, CURRENT AND PROPOSED

Item	Contractor	Date of Contract	Estimated Completion Date	Estimated Cost
Water Treatment Plant & Pumping Stations				
Raw Water Conduit	De Luca Const. Co.	Aug. '47	Completed 1948	$219,100
Raw Water Pumping Station	Akron, Ohio	Nov. '47	1949	561,800
Remodeling Pumping Station	Bass Eng. & Const. Co. Birmingham, Mich.	Feb. '49	1950	1,008,500
Steam Boilers	Wickes Boiler Co. Saginaw, Mich.	Aug. '48	1950	265,100
Turbines, Pumps and Generators	Dravo, Corp. Pittsburgh, Pa.	Aug. '48	1950	328,400
Furnishing Switchgear	Allis-Chalmers Mfg. Co. Milwaukee, Wis.	Aug. '48	1950	82,100
Electrical Installation	Uhl Electric Co. Akron, Ohio	Feb. '49	1950	194,000
Locomotive Crane	Interstate Equip. Sales Co. Cleveland, Ohio	Jan. '49	Completed	36,000
Laboratory Furniture	E. H. Sheldon & Co. Muskegon, Mich.	Dec. '48	1949	5,000
Furnishing Surface Filter-Washing Equipment	Palmer Filter Equip. Co. Erie, Pa.	Jan. '49	1949	21,000
Chemical Building and Head-house Extension	To be let in 1949			850,000
			Sub-Total	$3,571,000
City Storage and Distribution Mains:				
2-mg. Standpipe	Chicago Bridge & Iron Co. Chicago, Ill.	Aug. '48	1949	$69,600
2-mg. Standpipe (Foundation)	A. S. Helbig Co. Akron, Ohio	July '48	1949	26,800
24-in. and 20-in. Feeder-Mains: (Furnishing)	U. S. Pipe & Foundry Co. Burlington, N. J.		Completed 1948	246,400
(Laying)	DeLuca Const. Co.	Mar. '49	1949	131,800
Two 2-mg. and One 1-mg. Standpipes or Reservoir	To be let in 1949			400,000
Distribution System Extensions	To be let in 1949			107,400
			Sub-Total	$982,000
			Grand Total	$4,553,000

A fourth pump (5-mgd. capacity) operates by electricity generated by water power at the dam. The fifth pump (15-mgd. capacity), installed in 1934, will be run by a new 460-psi. steam driven turbine.

All auxiliary equipment in the water purification plant and the pumping station will be operated by electric motors using 440-v., 3-phase, 60-cycle a.c. current. Electric power will be supplied by two condensing steam-turbine driven generators of 500-kw. capacity each. A gasoline-driven electric generator also will be installed in the plant for standby power.

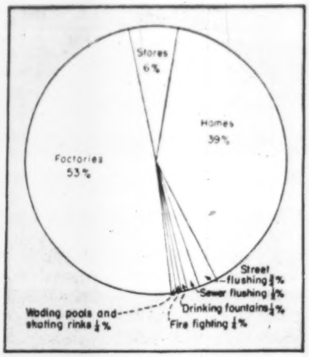
Not included in the present expansion program, but planned for future construction are 220x110-ft. settling basins and 120x110-ft. flocculation basins. Completion of these basins will give a detention period of 3 hr. and 15 min. for 50-mgd. of chemically treated and filtered water.

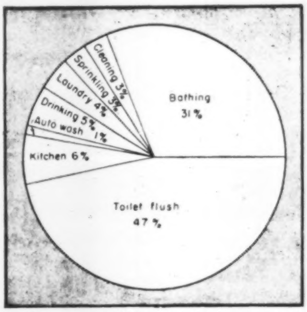
More distribution lines

The distribution system also is being expanded. One current contract covers the installation of 16,800 ft. of 24-in., 3,700 ft. of 20-in., and 1,100 ft. of 12-in. cast-iron feeder mains; plans are prepared for laying 20,000 ft. of 12-in. and smaller distribution mains. Also planned are two 2-mg. standpipe reservoirs and increase the capacity of an existing reservoir by 1-mg.

Total Cost (see the accompanying table) is $4,553,000. Of this amount $982,000 is for distribution and storage; the remainder, $3,571,000, is for expansion, rehabilitation and modernization of the existing water treatment and pumping plant—including the new raw-water conduit.

Contract work in the program is being financed from the sale, in May





WATER CONSUMPTION is about equally divided between factory demand and all other uses combined. Only 2-percent is needed for street cleaning.

1948, of $4,500,000 worth of revenue bonds. Bonds carry an average interest rate of 2.18 percent, and are callable after 15 years.

Water rates in Akron, currently in the lower bracket of the national average, have not been increased since 1920—and no increases are contemplated for retiring the bonded indebtedness of the expansion program.

Designers and engineers

Design plans and contract specifications for the plant improvements were prepared by Parsons, Brinckerhoff, Hall and MacDonald, and G. Gale Dixon, consulting engineers, New York City. They are also furnishing overall supervision of construction. H. E. Bakes is resident engineer.

The entire program is under the supervision of M. L. Davis, Akron's director of service, and W. R. LaDue, superintendent and chief engineer, Bureau of Water and Sewage. J. S. Gettrust is plant superintendent.

The program within the city is being planned and executed by the bureau's engineering forces. O. R. Elting is senior associate engineer and A. E. Goodman, associate engineer.

Digester Operates as Imhoff Tank During First-Stage Development

G. T. Sparrow
Associate Engineer, Parker & Hill, Consulting Engineers, Seattle, Wash.

An influent-effluent, weir-trough channel with a movable bottom converted a rectangular digester to an Imhoff tank in step-by-step development of sewage treatment facilities at White Salmon, Wash. The design permits reversal of flow, eliminates possible cross current between the two parallel clarifier sections, prevents difficulties with heavier settleable solids and helps take care of the floating solids.

White Salmon (population 1,200) —previously unsewered—started a sewerage program in 1948. This program included a treatment plant. (a state health department requirement). However, limited bonding ability compelled stage construction of the plant.

First construction item was what will ultimately be a 15x22-ft. digester, 22 ft. deep. To provide treatment facilities for the population presently being served, timber baffles were installed in the digester to form an Imhoff tank. Because digester proportions are not ideally suited for conversion to Imhoff-tank service, unusual problems were solved by a weir trough with a movable bottom.

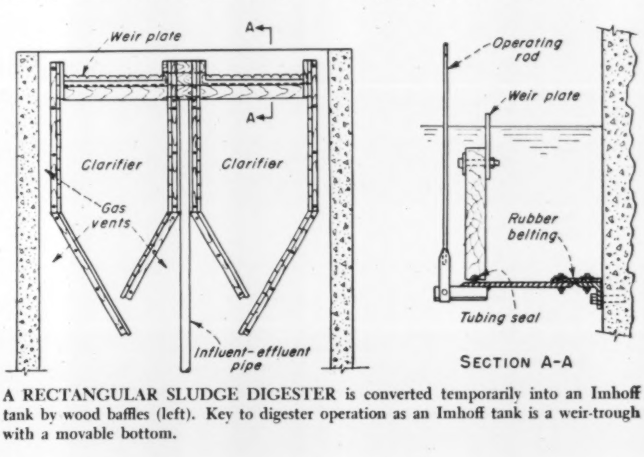
Foremost among the problems was how to conduct uniform flow through the two parallel Imhoff clarifiers without developing cross currents through slots in hopper bottoms. Movable channel bottoms solve this by maintaining uniform flow in each clarifier.

In operation, movable channel bottoms are closed at the effluent end of the tank and open at the influent end. The V-notch weirs are fixed at the same elevation at both ends to permit reversal of flow. With this arrangement, all effluent is over the weirs but influent is both over and under. Most flow into the tank is under the weir because of the relatively larger opening. Close adjustment of V-notch weirs and of openings in channel bottom results in an even division of flow and cross currents have not been observed. Thus, the problem of equal flow is met and reversal of flow is possible.

No difficulty is encountered in influent channels with heavy settleable solids because they are moved directly into clarifiers through the bottom opening. The relatively small amount of floating solids are effectively passed through V-notches into the clarifiers where they are easily removed by hand skimming.

Plant operation has been satisfactory. Some warpage in the timbers has necessitated occasional correction of minor leakage in effluent channels. Good primary plant effluent is being produced with a minimum of maintenance.

This plant and the sewer system were designed for the city of White Salmon, Wash. by Parker & Hill, consulting engineers, Seattle, Wash.



A RECTANGULAR SLUDGE DIGESTER is converted temporarily into an Imhoff tank by wood baffles (left). Key to digester operation as an Imhoff tank is a weir-trough with a movable bottom.

READER COMMENT

Too Many Student Chapters

Sir: As I aided the establishment at the Missouri School of Mines during the current school year of 1948-1949, a student chapter of the American Road Builders' Association and a student chapter of the Missouri Society of Professional Engineers, I have been asked by civil engineering friends and have been authorized by the Board of Directors of the Missouri Society of Professional Engineers to write an answer to your editorial "Too Many Student Chapters" (ENR March 10, p. 9).

Discussions at the national level are now being carried on between officers and committee members of the ASCE and the ARBA and the AGC concerning the establishment of student chapters of civil engineering students in our colleges by each of these organizations, and it is proposed to enlarge the field of discussion to include the AASHO and the AREA.

Without doubt there is a need for coordination and cooperation at the national level of these groups as they endeavor to reach civil engineering students through chapter activities, and I agree with you to the extent that the ASCE student chapter should come first for civil engineering students. Whether it is to be coordination or consolidation with or absorption by the ASCE student chapters of the currently active or new student chapters of the ARBA and AGC is subject to being settled either at the local level within each college civil engineering group or by agreement among the parent organizations at the national level.

Our electrical engineering students here at the Missouri School of Mines were in the process of setting up a new chapter of the Institute of Radio Engineers during this school year in addition to retaining the student chapter of the American Institute of Electrical Engineers which has been on the campus for a long time. Instead of ending up with two student chapters for electrical engineering students there was formed the AIEE-IRE joint student branch for the school.

Your editorial speaks as though there were only civil engineering students in our engineering schools. We have six engineering curricula other than civil on our campus, and for each curricula there is an appropriate national engineering society—mining, metallurgical, mechanical, electrical, chemical, and ceramic—and a student chapter.

During March, 1949, our engineering students organized a Missouri School of Mines Student Chapter of the Missouri Society of Professional Engineers in which the constitution provides that on the directing committee there will be a student representative from each of our seven engineering curricula.

The state societies of professional engineers are sponsoring student chapters. In many engineering schools and colleges active student engineering societies have existed for decades along beside the various active student chapters of the Founder Societies. On many college campuses the student engineering society may be functioning in such a manner that it could be chartered directly by the state professional society with no appreciable change in procedure or in function. On other campuses the student engineering society might be so tied down with local assignments that it would be more desirable to set up a new group to be chartered as the student chapter of the state professional society. We should leave it to the best judgment of the local engineering students and their professors as to whether the local existing student engineering society should be chartered or a new group should be organized.

Engineers have known for a long long time that they should stand together as a whole group if they are to function effectively in a professional sense. It is high time that the start for professional solidarity be extended to every engineering college campus where adequate profession-wide student chapters do not now exist.

Joe B. Butler
Professor of Civil Engineering
Missouri School of Mines
Rolla, Md.

In the editorial discussed by Mr. Butler we intentionally centered discussion on civil engineering students, realizing that presumably the same could be said about students in other branches of engineering.

We cannot see how the solidarity Prof. Butler bespeaks in his concluding paragraph will be helped by offering to civil engineering students an opportunity to join student chapters of the ASCE, NSPE, ARBA, AASHO, AREA, APWA, and AWWA, not to mention some of the newer organizations in the civil engineering field such as the Society for Experimental Stress Analysis and the American Society of Photogrammetry.

The solution reached by the electrical engineering students, cited by Prof. Butler, is substantially what we recommended for the civil engineering students, one student chapter in the civil engineering field, call it what you like.

In the larger schools where there is no all-inclusive student engineering society or council, establishment of a student chapter of the National Society of Professional Engineers would appear to be logical as an integrating agency. In the smaller schools it would be more logical for the NSPE or the state professional society to work with existing chapters of the Founder Societies in broadening the professional outlook of the students.

Obviously, no plan can succeed unless the pride and professional jealousies that have bedeviled intersociety relations for years are put aside. If we could just do that at the student level, possibly the coming generation of engineers, having no inhibitions, might succeed at the higher level where we older engineers have failed so miserably.—Editors.

"Goose Bay Mosquitoes"

Sir: You may be interested in the enclosed item, which was my contribution to our local scandal sheet. You will note that I gave proper credit to my source of information.

Sydney L. Ruggles
Airport Engineer,
Goose Bay, Labrador

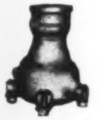
"Although it is at least two months before mosquito time, oldtimers are already boasting about the size and fierceness of the Goose Bay mosquitoes. However, some Alaskans will have to be shown that the local Anopheles are bigger and better than the Alaska variety. The December 2 issue of Engineering News-Record describes a new method of mosquito control originated by Dr. Morton C Kahn of the Cornell Medical School, who made a recording of the love call of the malaria carrying Anopheles Albimanus female mosquito, and played it back into a mosquito infested swamp. The deadly siren attracted hordes of male mosquitoes who were promptly destroyed by an electrical screen. Evidently male mosquitoes are as susceptible to the lure of the female as are male humans and can get burned as badly. Our radio shack has volunteered to broadcast the siren call, if some local entomologist will make a recording of the Goose Bay female Anopheles. Step right up, professor!"

PITTSBURGH-EMPIRE

water meters

Pittsburgh Arctic Disc Meter

Empire Oscillating Piston Meter Type 14

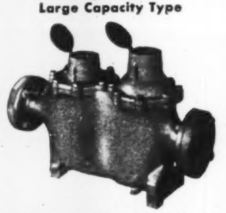


Empire Oscillating Piston Meter Type 12

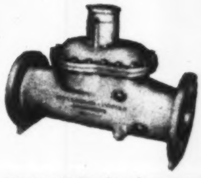
Pittsburgh Tropic Disc Meter

Pittsburgh Disc Meter Large Capacity Type

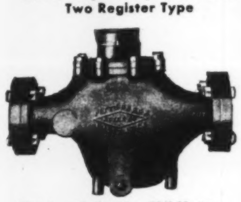
Empire Oscillating Piston Meter Type 16



Arctic-Tropic Compound Meter Two Register Type



Pittsburgh-Empire Compound Meter Single Register Type



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No matter what your metering requirements there's a Pittsburgh-Empire meter that will do the job—better and at lower overall measurement cost. That's because we make all commercial types of water meters. Among them is the type and size best suited to your individual requirements or preference. Our experienced sales engineers will gladly analyze the metering needs for any water system. Their recommendations can be made without bias and in the best interests of the community concerned.

We cordially invite

the members of the American Water Works Association to meet their friends during the annual convention at our headquarters.

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Rockwell Manufacturing Company • Pittsburgh 8, Pa.

Atlanta Boston Chicago Houston Kansas City Los Angeles
New York Pittsburgh San Francisco Seattle Tulsa

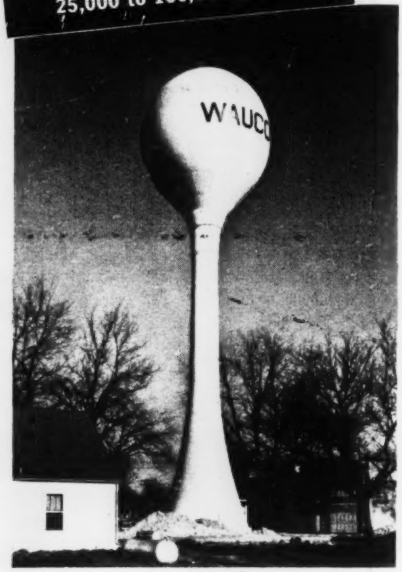
HORTON *Elevated* STORAGE TANKS...

Modern elevated water storage, utilizing the force of gravity, meets the most critical requirements of a water system. The head provided by an elevated tank maintains a uniform pressure in the mains even when pumps are shut down or temporarily out of service. The reserve capacity of the tank enables the system to handle peak requirements without overloading pumping equipment. Further, the use of elevated storage permits using smaller pumps since they need be sized only to meet average needs or for pumping during off-peak periods. Proper location of elevated storage facilities makes it possible to use the distribution system more efficiently—in effect, increasing the size of the system without adding new mains. The fire protection afforded by the reserve capacity and unfailing pressure means lower insurance rates and, more important, greater safety for lives and property.

All these advantages are yours with modern elevated water storage. And, where your system includes Horton elevated tanks, you get the additional benefits of attractive, graceful units that actually enhance their surroundings. Horton tanks are all of butt-welded steel construction, fabricated and erected to give long, dependable service.

Our engineers will be pleased to go over your elevated storage requirements. Write to the nearest office listed below.

WATERSPHERES
Capacities:
25,000 to 100,000 gallons



This 100,000-gal. Horton Watersphere 75 ft. to bottom serves the town of Wauconda, Illinois.

ELLIPSOIDAL BOTTOM TANKS
Capacities:
40,000 to 500,000 gallons

This 200,000-gal. ellipsoidal-bottom elevated water tank serves the city of Council Bluffs, Iowa.

CHICAGO BRIDGE

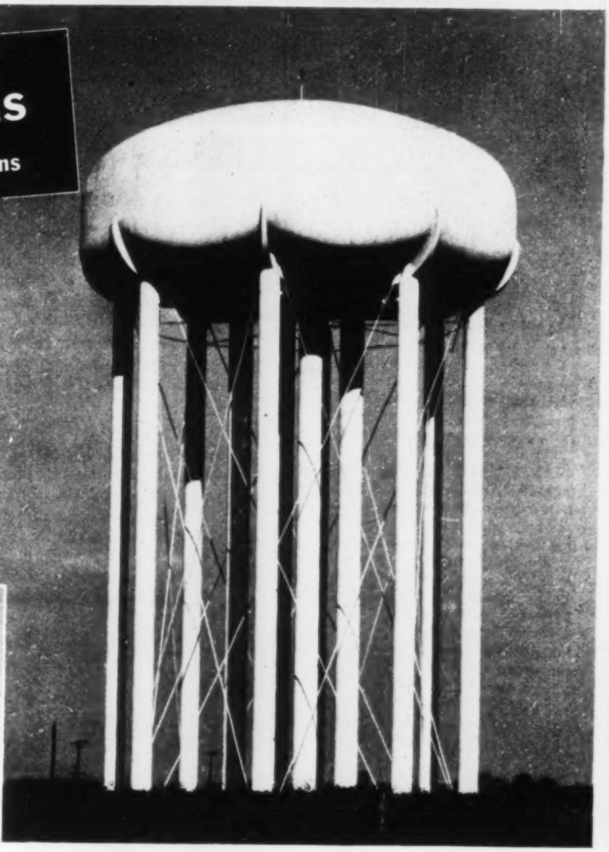
Atlanta, 3	2125 Healey Building	Cleveland, 15	2201 Guildhall Building
Birmingham, 1	1520 North 50th Street	Detroit, 26	1506 Lafayette Building
Boston, 10	1012-201 Devonshire Street	Houston, 2	2109 National Standard Building
Chicago, 4	2101 McCormick Building	Caracas, Ven.	Apartado 1348

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

a size and type to meet every need!

RADIAL-CONE BOTTOM TANKS
Capacities:
500,000 to 2,500,000 gallons

Right—This 1,000,000-gal. Horton radial-cone bottom tank serves Champaign, Illinois.



Below—This 500,000-gal. Horton Radial-Cone Bottom Tank serves Pontiac, Illinois.

We build ellipsoidal-bottom elevated water tanks with angle post columns from 15,000 to 40,000 gals., ellipsoidal-bottom tanks with cylindrical columns from 50,000 to 500,000 gals. and radial cone bottom tanks from 500,000 gals. to 2,500,000 gals. capacity.

You are invited to make our booth, Nos. 106 and 107, your headquarters while you are attending the 1949 A. W. W. A. Convention, in Chicago, May 30-June 3.

& IRON COMPANY

Havana .... 402 Abreu Building
Los Angeles, 14 .... 1511 General Petroleum Building
New York, 6 .... 3311-165 Broadway Building
Philadelphia, 3 .... 1623-1700 Walnut Street Building
Salt Lake City, 1 .... 1512 First Security Bank Building
San Francisco, 11 .... 1220 22 Battery Street Building
Seattle, 1 .... 1312 Henry Building
Tulsa, 3 .... 1617 Hunt Building

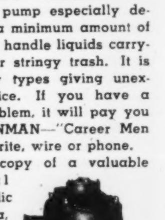
In Canada: HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

There's a Good Reason WHY ENGINEERS PUT THEIR PUMPING PROBLEMS UP TO WEINMAN

Over a 60 year span, engineers have learned to rely on Weinman for help on ANY pumping problem. This organization of Centrifugal Specialists devotes itself to ONE product—*pumps* . . . their application . . . installation . . . and satisfactory performance on the job.

Illustrated is the Weinman Non-Clogging Type U pump especially designed to occupy a minimum amount of floor space and to handle liquids carrying large solids or stringy trash. It is just one of many types giving unexcelled daily service. If you have a fluid handling problem, it will pay you to talk with WEINMAN—"Career Men in Pumps". Just write, wire or phone.

For your free copy of a valuable reference manual containing Hydraulic Engineering Data, fill out and mail the coupon below.



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UNIT PRICES BID BY CONTRACTORS

Unit Prices Available on Two Turnpike Jobs

ENGINEERING NEWS-RECORD will send, upon request, copies of unit prices bid on two Pennsylvania Turnpike Extension contracts that have been let this year. The first covers earthwork and drainage structures for a 4-mile section in Dauphin and Lebanon Counties and the second covers all work, including 4-lane concrete pavement, on a 5-mile section in Lebanon and Lancaster counties. The former contract was awarded in February to H. J. Williams Co., York, Pa., low of nine bidders, for $938,570. The latter was awarded this month to Harrison Construction Co., Pittsburgh, low of five, for $3,381,286. Major-quantity prices include: $0.61 for 378,486 cu. yd. of common excavation, on the smaller job; $0.90 for $1,083,019 cu. yd. of common on the larger; $4.90 for 149,994 sq. yd. of 9-in. reinforced concrete pavement 24 ft. wide, on the larger.

Gas Pipeline for AEC

Natural gas service to Los Alamos, N. M. will be obtained through a 95-mile 12¾-in. welded steel pipeline on which bids were taken by the Atomic Energy Commission April 28. Thirteen bids ranging from $1,048,725 to $1,853,602 were received (one bidder priced one of two sections at $2,944,220, but did not bid on the other section). The AEC estimate was $2,210,482. The low bidder was Morrison Construction Co., Austin, Texas. The two sections comprise 270,000 ft. and 231,400 ft. of line. Morrison's unit prices for pipeline were $0.81 and $1.37, respectively for the two sections. Other units include coating and wrapping 178,400 ft. of pipe, and building 29 miles of road.

Concrete Pavement, Kansas

Koss Const. Co. of Des Moines was the low of five bidders on 11.5 miles of concrete pavement in Montgomery County, Kansas. His bid of $554,928 (high was $641,442) covered thirteen items, including common excavation, 23,850 c.y. at $0.20, pavement (9-8-9-in.), 147,924 s.y. at $3.24 (Second low, $3.36), and granular sub-base (4-in.), 162,073 s.y. at $0.36. Wages, $0.70 to $1.00. 90 days. Awarded Jan. 28, 1949 by Kansas State Highway Department.

More Work at Fort Peck

Fort Peck dam, the Army Engineers' giant earthfill structure on the Missouri River in Montana, currently is being modified in a program of work involving drain ditches for pressure relief wells, revisions to the relief-well outlet facilities, and access roads. Engineering News-Record has unit-price data for one of these jobs, on which bids were taken April 5. Francis P. Murray and Angelo S. Weir, Sidney, Montana were low of five bidders, with a total of $83,585. They bid $0.90 a yard on 29,630 cu. yd. of common excavation, against a range of $0.82 to $1.20 among the other four. High bid was $94,666 and the engineer's estimate was $74,565 (estimate without profit).

Water Treatment Plant, Idaho

Part of the work covered by The Bureau of Reclamation's contract for a water treatment plant for the Lewiston Orchards project in Idaho was let on a unit-price basis. Items include 25,025 cu. yd. of excavation, 1,575 ft. of 18-in. concrete pipe, 2,144 barrels of cement. When bids were opened April 1, J. F. Konen, of Lewiston, Idaho, was low of six (two bids on only one of two schedules), at $266,101. Plant is to be 6½ miles south of Lewiston. Schedule I is for construction of a 1,500,000-gal. clearwater reservoir; Schedule II is for filter-house (four rapid-sand filters), and coagulation and sedimentation basin. Time: 180 days.

Seven Contractors Bid on Wyoming Streets

With a low bid of $95,742, Peter Kiewit Sons of Omaha received 0.841 mi. of street work in Lyman, Wyoming, Jan. 28. The 100-day contract includes federal aid and non-federal aid items for 60-ft. and 68-ft. width, including curb and gutters. Oil treatment over gravel base. The first three bidders priced some major items closely. For instance, Kiewit's price on 45,400 cu. yd. of excavation was $0.39, compared with the second and third bids of $0.38 and $0.40.

◆

Unit price reports on jobs cited in these columns will be mailed to readers of Engineering News-Record on request at no charge. Address: Manager, Business News Dept., Engineering News-Record, 330 W. 42nd St., New York 18, N. Y. Identify by quoting headline as used herewith, and be sure to give full mailing address.

What ZURN Building-Plumbing Products Have *that can't be duplicated*

Practical ideas! Any idea which when embodied in a building-plumbing product does one or all of these two things: (1) reduces time-wasting grief on installations, and protects the contractor's time-cost cushion on the job, (2) provides a greater degree of sanitation, and protection to buildings, and to people who live, work or play in them.

Professionally trained Zurn Engineers, enlightened by over 40 years of experience, are continually developing and incorporating into Zurn building-plumbing drainage products ideas that can't be duplicated. A recent example of the application of practical ideas conceived by Zurn Engineers is presented in the features of the Zurn Easy Level Floor Drain.

Zurn Engineering is engaged continually in research to discover new and unusual drainage requirements common to modern types of buildings. Thus do Zurn Engineers conceive practical ideas for building-plumbing drainage products that can't be duplicated.

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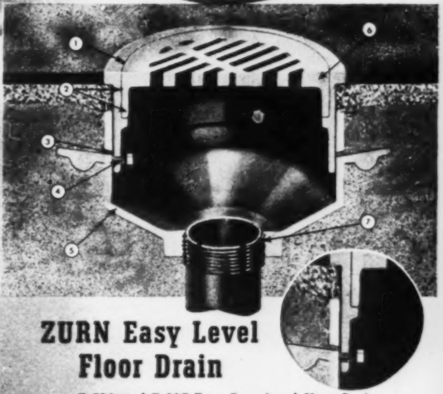


ZURN Easy Level Floor Drain

Z-506 and Z-507 Zurn Easy Level Floor Drain

1. Weight of frame and grate supported by flanged frame
2. Entire frame and grate have been raised to new level
3. Seepage orifice
4. Adjustable locating bolt—one of three
5. Heavy duty dura-coated cast iron body
6. Extra heavy deep flanged grate
7. Pipe connection undisturbed in floor resurfacing operation

Zurn Engineers designed the Easy Level Floor Drain to solve an old and troublesome problem – how to make quick and easy and accurate adjustment of drains to floor level when floors are re-surfaced. Their greatest use is in floor areas subject to heavy wear, such as in manufacturing plants, industrial plants, garages, hangars, laundries, and large open areas.

Easy Level Floor Drains are designed for both new and old construction. Adjustment is made without "trial and error" chipping of the concrete. To raise the Easy Level Floor Drain, simply loosen the strainer from the cement, remove grate, loosen locating bolts on the frame, raise to desired level, and tighten bolts. It's that quick and easy. Foolproof and positive adjustment is on the inside of the drain.

Special features incorporated in the Easy Level Floor Drains by Zurn Engineers include deflecting bar type grate with the area of the openings in the correct ratio (or better) to the pipe size to handle water faster, low over-all height for shallow construction, streamlined design – no close fitting parts or pockets to become fouled with concrete, and pipe connections are not disturbed in making adjustment.

For floor areas with neat, smooth and level junction at the drain when re-surfacing is done, specify Zurn Easy Level Floor Drains for the original installation.

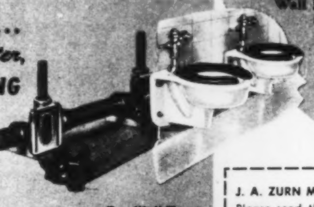
Everything for Drainage Systems *except the pipe* The complete line of Zurn Building, Plumbing, Drainage Products includes: Floor and Roof Drains for every type of installation • Grease Interceptors • Oil Interceptors • Plaster and Solids Interceptors • Swimming Pool Equipment • Backwater Valves • Wall Fixture Carriers • Wall Closet Fittings • Plumbing-Drainage Fittings • Cleanouts • Bath Traps • Hydrants • Street Washers.

ZURN PROVIDES BETTER WAYS TO...
drain waste and rain water,
THROUGH RESEARCH AND ENGINEERING

Z-1231 Chair Carrier for Wall Type Lavatories

Z-506 and Z-507 Zurn Easy Level Floor Drain

Z-542 Zurn Continuous Flow Solids Retaining Floor Drain



Zurn Wall Closet Fittings for Installation of Batteries of Wall-Type Closets

Z-1171 Zurn Deluxe Cast Iron Greaseptor

Z-1098 Zurn Backwater Sewer Valve with Clean-sweep Water Ways

Zurn Draindicator saves time and work for engineers, architects and plumbing contractors, who are eligible for a complimentary copy.

J. A. ZURN MFG. CO., Pittsburgh Ave., Erie, Pa., U. S. A
Please send the following literature:
☐ Catalog 47-1 of Zurn Building, Plumbing, Drainage Products
☐ Zurn Draindicator (Drainage Pipe Sizing Chart)
☐ Zurn Booklet on Wall Closet Fittings
☐ Zurn Handbook on the Proper Sizing and Selection of Grease Interceptors
☐ Zurn Carriers Catalog No. 49

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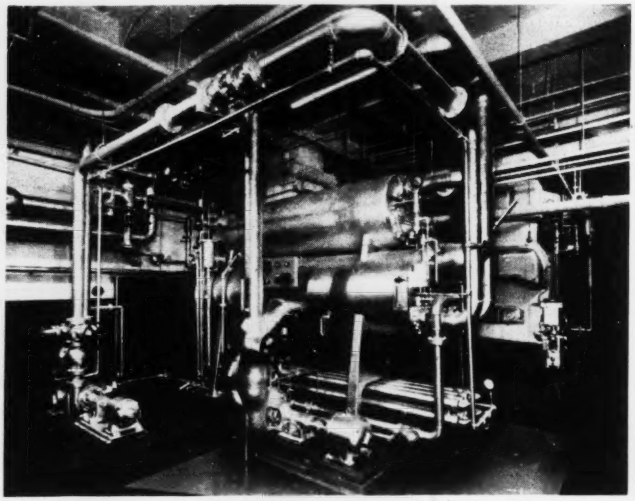
Company
Street
City *State*

49-11

NEW PRODUCTS



THIS ABSORPTION MACHINE provides refrigeration for the air conditioning of the Oklahoma Natural Gas Building, Oklahoma City, Okla.

Steam for Air-Conditioning

Production of a new refrigerating machine that employs steam for air-conditioning purposes has been started. Representing more than eight years of research and development, the new unit is an absorption machine that uses plain water as a refrigerant and a simple salt as an absorbent.

The unit can operate on either high or low-pressure steam, or even low-pressure waste steam. Aside from a small solution pump, it has no moving parts and therefore, according to the manufacturer, it is practically noiseless and vibrationless.

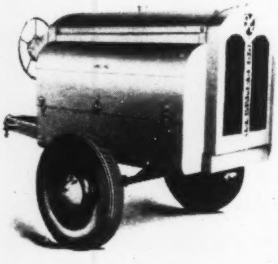
It is also reported to be lighter in weight and more compact than other heavy-duty refrigerating equipment. And with a low-cost source of energy, operating costs are reasonable. The initial cost is about the same as for most conventional types.

The new machines are being produced in 115, 150 and 200-ton capacities. Single units will air condition areas of from 34,500 to 60,000 sq. ft. The machine is about 5 x 14 ft., 1 story high, and places on the floor a load averaging 150 psf.

The machine lowers temperature through flash evaporation of sprayed water. The evaporation is induced by a highly absorptive brine solution, which is used repeatedly without loss of salt by boiling off the water with steam and pumping it back into the absorber chamber.

Tests have shown that the present absorption machine operates at double the efficiency of ammonia machines, but the materials used are non-toxic and the initial cost is less because there is no need for rectifiers to purify the refrigerant.

The machine uses less than 20 lb. of steam per hour per ton of refrigeration—no matter what the steam pressure. It will automatically adjust itself to partial loads down to 15 percent of total capacity without loss of efficiency, and when higher tonnages are required it is readily adaptable to multi-unit installations. — CARRIER CORP., SYRACUSE, N. Y.

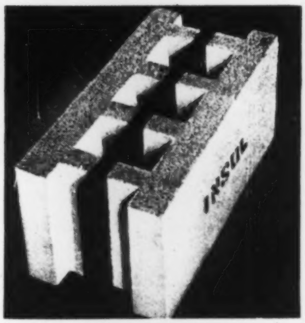


Streamlined Compressor

Weighing only 950 lb. with skid mounting and 1100 lb. with trailer mounting, O.K. Compressor SS60 delivers 60 cu. ft. of free air and can be easily towed or carted to the job. It uses a Ford motor and standard automotive parts. Air tank capacity is 4 cu. ft. It is water-jacketed.—O.K. CLUTCH AND MACHINERY CO., COLUMBIA, PA.

Electrode for Welding Cast Iron

New electrode called Softweld is for depositing dense, soft machinable welds in gray-iron castings. It is a non-ferrous electrode and operates with a soft, steady arc on either alternating or direct current. The entire weld area may be drilled, machined, sawed or tapped with ease. Recommended for use both in original manufacture as well as for repairing broken or defective castings and correcting machining errors. Available in 14-in. length in 1/8 and 5/32-in. sizes, packaged in 10-lb. containers.—LINCOLN ELECTRIC CO., CLEVELAND 1, OHIO.



Insulated Concrete Blocks

In the "Insol" block a ½-in. asphalt-treated insulation board is built into the center of the block and secured with eight corrugated sections of 16-gage galvanized steel wire. Plaster and stucco can be applied directly to the blocks. It can be made by local concrete block plants under franchises to be let nationally.—INSOL CO., 315 OPPENHEIM BUILDING, ST. PAUL 1, MINN.

Stainless Steel Face Nail

Self-clinching face nail attaches asbestos shingles to gypsum and insulation sheathing. New nail has two legs, one enclosing the other, hinged near the end and forming a triangular loop at the top. When nail is driven, last blow of hammer flattens head of fastener which, by automatic lever action, cause locking foot to be drawn up behind the sheathing material. Face nail is available in two sizes, both for use with asbestos shingles: the 1⅜-in. length on ½-in. non-wood sheathing and the 1¾-in. length on 25/32-in. insulation sheathing. — ELASTIC STOP-NUT CORP. OF AMERICA, 2330 VAUXHALL ROAD, UNION, N. J.

Want to cut Maintenance Costs?

Byers Wrought Iron

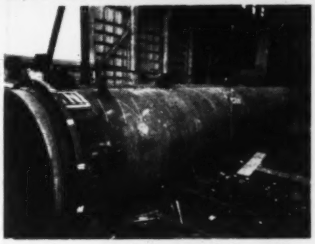
PLATES and BARS

can help

Even a minor repair is expensive today, and any major replacement is a serious drain on profits. The only sure protection against this waste is the use of a *durable* material, that will give the longest trouble-free life.

Byers Wrought Iron pipe has been an invaluable aid to engineers in combating corrosion, and so reducing repairs and replacements in pipe lines. The same proven corrosion resistance helps to solve maintenance problems in applications where plates or bars are used. A few of the many installations where Byers Wrought Iron hot rolled products are successfully serving are shown here. These may suggest places where you could profitably use wrought iron.

The difficulty and the cost of repairs to elevated tanks and standpipes makes durability a prime requirement. Wrought iron's record certifies its longer life. One elevated tank was recently torn down, after 62 years of continuous service, during which it was exposed not only to internal corrosion, but to salt air from the ocean, a short distance away. Several municipalities have water towers of wrought iron still in service after 50 years or more, which have received no maintenance beyond an occasional painting.



In large underground lines like the one illustrated, Byers Wrought Iron helps to guard against premature failures and excessive repairs. In one municipality, for instance, a 50" wrought iron water line is still serving after 60 years. Only one leak has ever been reported, although operating pressure is 135 pounds.

Severe corrosion can always be expected in unlined metal stacks, and changes in fuels, addition of economizers or draft inducers, or other factors may aggravate the condition at any time. Wrought iron has made an impressive record in this service. Users who have made comparative tests have reported up to four times the service from wrought iron.

Blast gases from locomotives quickly weaken ordinary structural members. Wrought iron blast plates provide needed protection. In one historic installation, wrought iron served for over 60 years before replacement.

Hulls of work boats operating in salt, brackish or polluted waters must take a severe beating. Wrought iron has proven itself in this gruelling service. A number of ships with wrought iron hulls are reported as still serving after half a century or more.

If you have any corrosive application where ordinary flat rolled materials do not stand up, you'll find it profitable to investigate the service record of wrought iron. The nearest District Office will be glad to give you a technical bulletin, or detailed information on request.

A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, Seattle, San Francisco. Export Division: New York, N.Y.

CORROSION COSTS YOU MORE THAN WROUGHT IRON

BYERS

GENUINE WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

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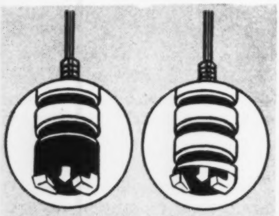
Car Shaker

A new car shaker for emptying coal, cinders, ore, sand and gravel and other granular materials quickly and safely from drop-bottom gondola cars has been announced. Weighing about five tons, the shaker is designed to fit all sizes of gondola cars manufactured in the United States. It has an all-welded 11 by 5 by 4-ft. 4-in. steel body which is lowered to rest on the car body flanges by a hoist or crane. Vibratory motion is transmitted to the car through an eccentric shaft mounted within the shaker body on heavy-duty bearings. The unit is driven by a totally-enclosed, high-torque, rubber-mounted motor located inside the shaker body for full protection. A completely enclosed Texrope drive with deep groove sheaves is used for power transmission.—ALLIS-CHALMERS MFG. CO., MILWAUKEE.



OLD STYLE • NEW STYLE
SOLID HEAD • "ALL-WORM"
CONCRETE TERMITE

"All-Worm" Head

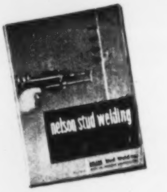
A newly-improved "All-Worm" head has been added to all Concrete Termite rotary drills. The old style Concrete Termite solid head, patent #2425132 left above, permitted pulverized material to remain at bottom of hole, generating excessive heat and shortening life of drill.

The new patent pending "All-Worm" head starts immediately to carry away the pulverized material from the tip. This means less heat, less friction, faster drilling and longer life. Drills are available in sizes from $\frac{3}{16}$" to $1\frac{1}{4}$" diameters. Dealers needed to service inquiries.—CONCRETE TERMITE ROTARY DRILL CO., 2081 FOOTHILL BOULEVARD, PASADENA, CALIF.

High-Lift Boom on Paving Mixer

Available for both single and double drum (34E) MultiFoote concrete paving mixer, high-lift boom controlled from operator's platform and held in any position above ground provides 23-ft. bucket clearance. This feature enables paver to be used in a variety of work such as bridge abutments, retaining walls, parapets, footings and walls for general building construction. Boom will work flat to permit opera-

(*Continued on page 77*)



New Booklet Shows How to Cut Costs!

Illustrates how contractors are using Nelson Stud Welding to apply the following materials *faster, better,* and at *far less cost:*

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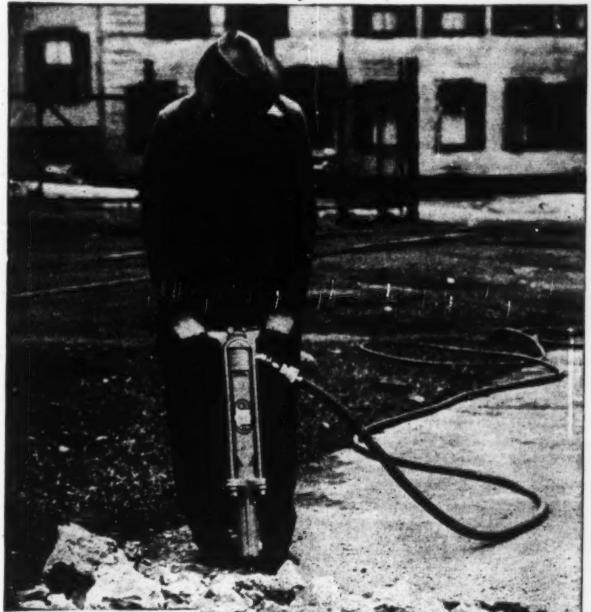
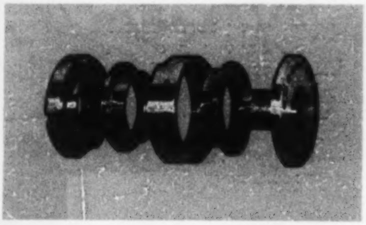
DO IT FASTER, CHEAPER WITH

JOY PAVING BREAKERS

They Hit Hard!

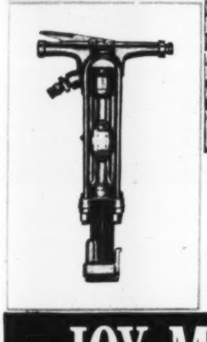


JOY "Silver Streak" Paving Breakers can show you real time and cost-saving advantages. They're designed to deliver maximum piston blow, yet with a permanent "cushion" that results in smoother operation—less jarring and operator fatigue—less maintenance and replacement cost. What's more, they're cadmium-plated inside and out—an exclusive JOY feature which makes "running-in" easier and quicker, and protects against deterioration from rusting. ● Write for a bulletin, and ask for an actual demonstration—let us *prove* the superiority of JOY Paving Breakers right on your job.



The Famous JOY "Dual Valve" that makes air do more work.

In JOY Paving Breakers, the exclusive patented "Dual Valve" assures top working efficiency, and air-cushioned smoothness on both up and down strokes of the piston.

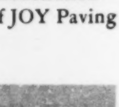


Above: the Joy K-81 Paving Breaker is a rugged tool capable of maximum output on heavy-duty work.

Left: the K-61 Paving Breaker, a powerful, easily-operated tool for all lighter demolition jobs.

W&D C2107

Consult a Joy Engineer



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GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

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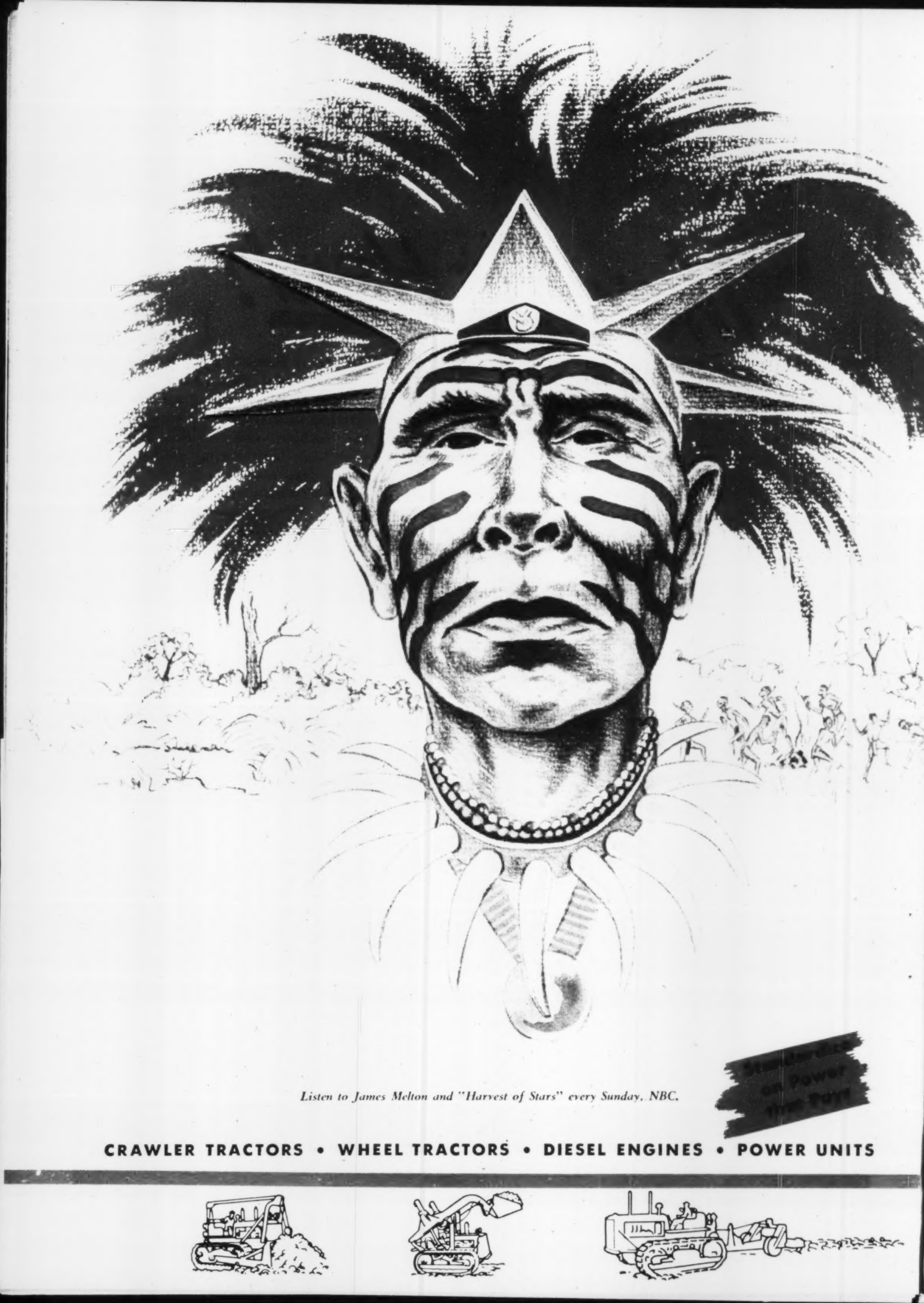
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Since reliable, economical power is "good medicine" for any power-using business, it will pay you to contact your International Industrial Power Distributor. Get International Diesels on your jobs now.

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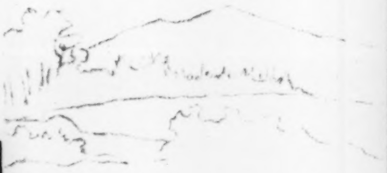

An International TD-18 Diesel Crawler fills its 8-yard scraper quickly on this tough, deep-sand road job. Latest model, with increased drawbar horsepower and many improvement., 's now available.

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"More hauls, fewer overhauls with Gulf Quality Lubricants and Fuels"

says Mississippi Levee Contractor

Pioneer Contracting Company, Memphis, Tennessee, has a big share of the new levee construction work at Fitler, Mississippi, and south of Vidalia, Louisiana. Gulf quality lubricants and fuels are helping this contractor keep equipment on the job and operating efficiently.

EARTH-MOVING for a Mississippi levee project is measured in the millions of yards! It is the kind of job on which the contractor is not likely to take chances with his equipment. He wants the best lubrication and the most efficient fuels to insure top performance and prevent costly mechanical delays.

That is why Pioneer Contracting Company selected Gulf quality lubricants and fuels for its big levee project, which involves moving over 4 million yards on a tough time schedule—a grueling test for men and equipment.

Pioneer Contracting Company, and many other leading contractors, use Gulf quality lubricants and fuels as basic profit insurance. They know that Gulf products make the job run smoothly and efficiently — keep operating costs at rock-bottom levels.

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tion under steel structures. Useful in loading concrete buggies on structures. Applicable to general concrete placement in addition to paving work. —THE FOOTE CO., INC., 1910 STATE ST., NUNDA, N. Y.

Tie Wire Reel

Increased efficiency in tying reinforcing steel is available through use of the newly developed tie-wire reel being used by the man on the scaffold on reinforcing for the Youth Guidance Center being built by Munson Bros., for the city of San Francisco. Use of the reel permits complete safety in getting to difficult places. Built of a lightweight aluminum alloy, it can be refilled with new wire in fast time. Subcontractor for steel work on this job was Soule Steel Co. Reels are available through—UNIVERSAL PACIFIC CO., 6TH AND HOOPER ST., SAN FRANCISCO 7, CALIF.

Aluminum Jack Support

Weighing only 8¾ lb., Simplex aluminum jack support is designed to replace wooden wedge supports and has a two-way upright or inverted use. Recommended for use in combination with Simplex speed journal jacks. Journal jacks are suitable for inspecting and renewing railway journal brasses, for bridge builders, tank and structural steel builders, ship builders and in other industries where powerful jacks of low height are required.—TEMPLETON, KENLY & CO., 1020 SO. CENTRAL AVE., CHICAGO 44, ILL.

Saw Blade To Cut Siding

New blade for Model A-4 Guild power saw cuts slate-surfaced insulating siding. Teeth have no set; they are ground to knife edge on periphery. Blade can be resharpened by holding

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"QUICK-WAYS"
REG. U. S. PAT. OFF.
FOR SURE PROFITS

In all power shovel applications, capacity and utility are essentials. A truck shovel must have high speed mobility, be immediately convertible, and have adequate capacity to be economical on every job. A *"QUICK-WAY"* has all these fundamentals plus a long list of others.

"QUICK-WAYS" are designed for full truck speed, on or off the highway. Mounted on any standard truck, the working parts provide perfect operating balance for the truck shovel. All-steel construction gives built-in strength and lightness for maximum capacity and stability.

You get more utility out of a *"QUICK-WAY"* fully equipped, than any comparable equipment. Each *"QUICK-WAY"* is easily converted in minutes from Shovel to Crane, Dragline, Clamshell, Pile Drive, Scoop, Trench Hoe, Backfiller, etc. Buy only the attachments you want; your *"QUICK-WAY"* does more jobs better.

Parts are rugged and simple, requiring a minimum of servicing and having proved ability to take a life long beating. Many interchangeable parts and easy accessibility simplify maintenance and repair. From engine to attachment, every *"QUICK-WAY"* part will deliver its capacity rating and more.

The essentials built into every *"QUICK-WAY"* mean sure profits on a small investment; economical to buy, economical to use, it's one of the most useful machines you can own. There's a *"QUICK-WAY"* owner near you; ask HIM.

MODEL E: 4/10 cu. yd. capacity, mounts on any standard 5-ton truck.
MODEL J: 1/4 cu. yd. capacity, mounts on and standard 1½-ton truck.

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VIBRATING SCREED

NEW STOW

VIBRATING SCREED

With Wood Beam and Cradled Vibrating Unit

The new STOW Vibrating Screed consists of a solid wood beam, steel-shod to resist abrasion. It vibrates evenly over its entire surface—eliminates "dead" spots . . . gives uniform density of concrete.

STOW SCREEDS

are highly adaptable to different construction jobs. Where transverse crowns and widths vary, wood beams can easily be cut to fit the contour. When building a concrete curb integral with the pavement slab, you merely notch one end of the beam.

SHOCK-PROTECTED MOTOR MOUNTING

The 1½ HP Power-Pak with built-in vibrator is cradled over the beam on two sturdy brackets. Four multiplane vibration dampeners protect the motor by absorbing both horizontal and vertical screed vibration. This practical design means less maintenance . . . fewer breakdowns . . . more time on the job.

STOW SCREEDS come in four models: 6, 8, 10 and 12 ft. spans. Longer spans on special order.
WRITE TODAY for full information.

STOW Manufacturing Co., 19 Shear St., Binghamton, N. Y.

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FOR COMPLETE DETAILS WRITE TODAY
PLYMOUTH LOCOMOTIVE WORKS
DEPT. A-4 PLYMOUTH, OHIO

a stone against it while running. Siding faced with slate particles is cut from rear surface to a depth which just avoids the slate; the siding then breaks off clean.—Porter-Cable Machine Co., Syracuse 8, N. Y.

Pneumatic Paving Breaker

New 70-lb. pneumatic paving breaker, Model 24, has 28-in. overall length, 1½x6-in. chuck sizes for collared steels, ¾-in. hose size, and ¾-in. hose inlet pipe thread.—Independent Pneumatic Tool Co., 175 State St., Aurora, Ill.

Dowel Type Road Joint

To overcome cracking and disintegration of concrete highways because of expansion and contraction, the almost universal practice is to divide the roadway into a series of individual slabs connected by steel dowels fixed in one slab and free in the adjacent slab. The dowels permit the slabs to slide but keep them in horizontal and vertical alignment while transferring the load on one slab to the next across the open joint. Often the oil used to protect the free side of the dowels dries up, allowing ordinary dowels to corrode and freeze in the slab. Thus there would no longer be any expansion joint. The N. J. highway department protects the free side of the dowel with stainless steel by press fitting a length of stainless steel tubing .035 in. thick over a little more than half of the dowel. This company claims to have designed a tubular dowel which incorporates the good features of the New Jersey dowel at about half the cost. Mechanical tubing is used. Stainless is placed on the dowel which is expanded by passing a plug through it until a tight fit between the dowel and the stainless is obtained. For further particulars, write to—Springfield Products Co., 287 Beech St., Teaneck, N. J.

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WeldELLS *have everything!*
WE MEAN:

Everything in balanced and practical design . . . Engineered strength distribution; close limit metallurgy; uniform and geometric dimensional accuracy.

Everything in utility and convenience . . . Clear, complete identifications; quarter markings that speed up easy accurate lineups; cleanly machined bevels that mean faster, sounder welding; forge-sized end tangents for extra convenience.

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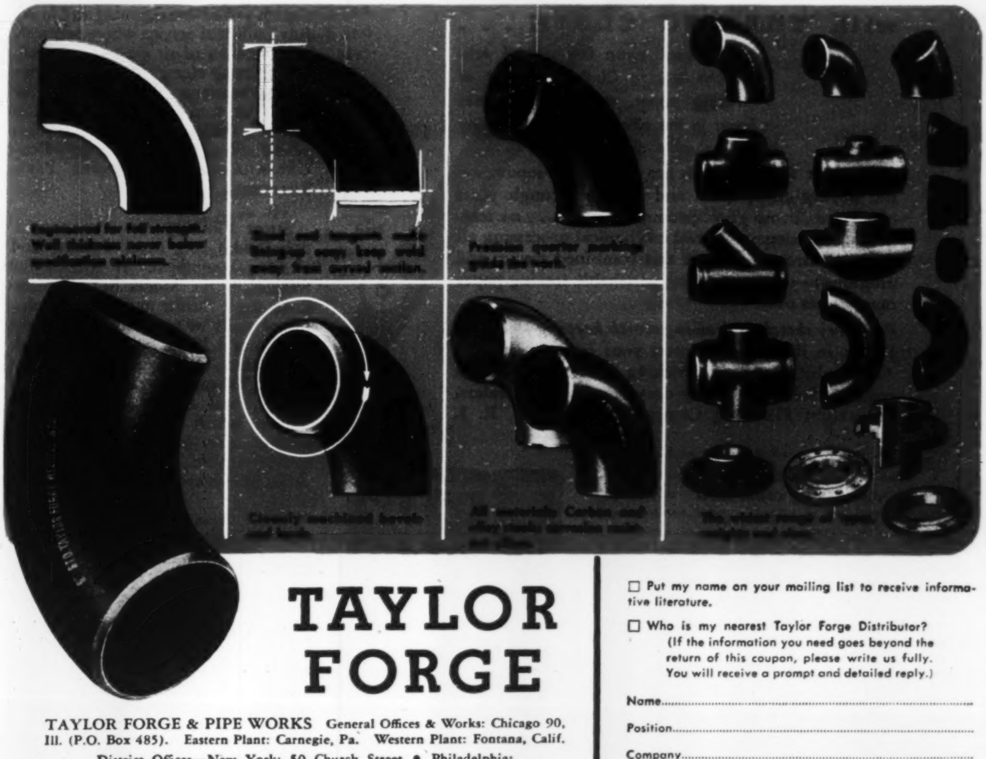
All of these are combined only in the WeldELL line. Why accept less?


Engineered for full strength. Wall thickness never below specification minimum.
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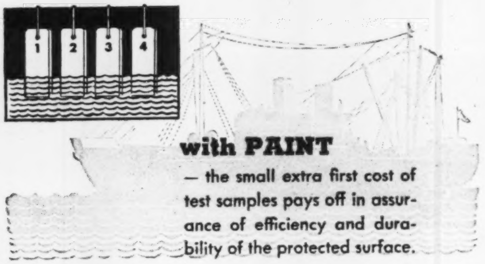

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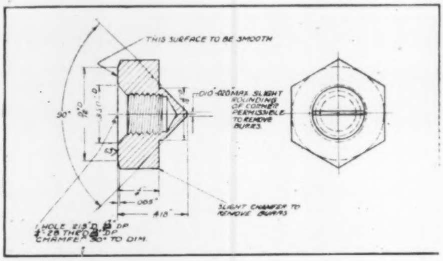
THIS SURFACE TO BE SMOOTH
.010"-.020" MAX. SLIGHT ROUNDING OF CORNER PERMISSIBLE TO REMOVE BURRS
90°
.005"
.418"
SLIGHT CHAMFER TO REMOVE BURRS
CHAMFER 30° TO DIM

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Manufacturers' Publications

Used Equipment—Bulletin 515 of the Hyman-Michaels Co. offers used construction and railroad equipment, railroad car parts, rails and accessories, trucks and trailers, structural steel, and pipe and fittings. It is a used products catalog par excellence, thoroughly illustrated photographically and giving all necessary information about all items. The company has offices and warehouses at St. Louis, Mo., San Francisco and Los Angeles, Calif., and Portland, Ore. Its general office is at —HYMAN-MICHAELS CO., 122 S. MICHIGAN AVE., CHICAGO 3, ILL.

Automatic Air Filter–A bulletin explains all about the Staynew Model A-3 automatic filter, which is specifically designed for both average ventilation and air conditioning and heavy duty industrial service where relatively large volumes of air are to be filtered. The filtering elements consist of two endless curtains carried on roller chains in turn driven by sprockets keyed to the shafts of the curtain rollers, afloat on ball bearings.—DOLLINGER CORP., 11 CENTER PARK, ROCHESTER 3, N. Y.

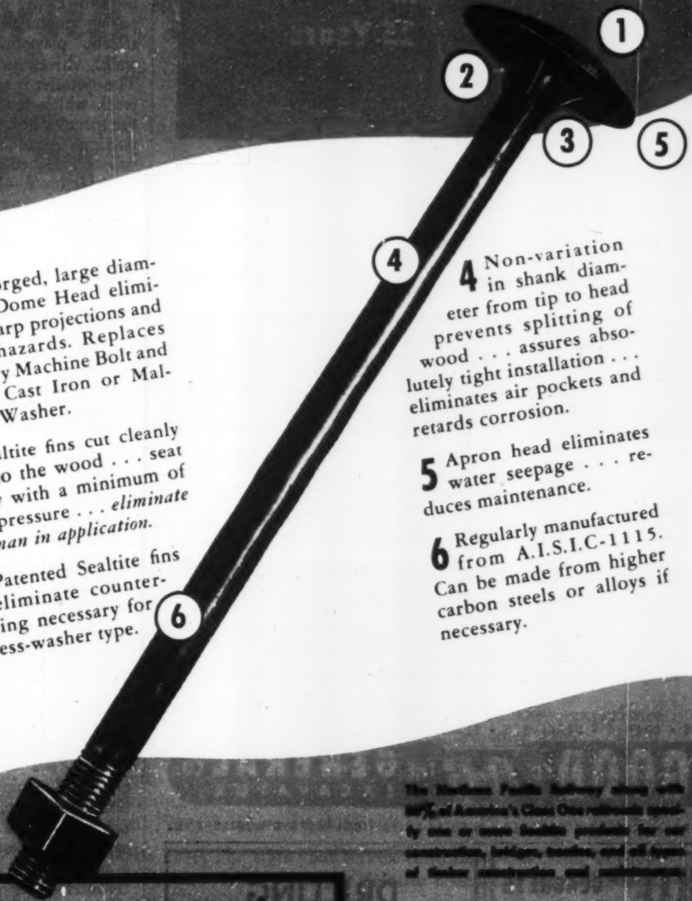
Street Flushing–An interesting 8-page folder lists street flushing and cleaning equipment. It stresses the features of the Model MTA streamlined street flusher and includes photos of units in use. Standard model is built in 1,200, 1,600 and 2,100-gal. capacities. Other machines shown are a 1,000-gal. capacity, 2-wheel type flusher, and a power-driven street cleaner which cleans with a water blanket spray in front of the brush. —ROSCO MFG. CO., 3,118 SNELLING AVE., MINNEAPOLIS 6, MINN.

Fuel Transfer Pump–Literature describes the "Utility Master", a low-cost, hand-operated barrel-type pump of special value in connection with outdoor construction machinery like power shovels where a dependable transfer pump is required. It is also for portable use with necessary equipment for pumping from barrels and skid tanks. It is light-weight and compact.—LEAR, INC., ROMEC PUMP CO., DIVISION, ELYRIA, OHIO.

Metal Partitions–Here is a 56-page catalog that is really a practical working tool for all who deal with the problems of flexible division of in-

SEALTITE

DOMEHEADED WOOD BOLT



1 Hot forged, large diameter, Dome Head eliminates sharp projections and safety hazards. Replaces ordinary Machine Bolt and use of Cast Iron or Malleable Washer.

2 Sealtite fins cut cleanly into the wood . . . seat firmly with a minimum of side pressure . . . *eliminate one man in application.*

3 Patented Sealtite fins eliminate counterboring necessary for recess-washer type.

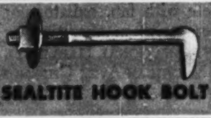
4 Non-variation in shank diameter from tip to head prevents splitting of wood . . . assures absolutely tight installation . . . eliminates air pockets and retards corrosion.

5 Apron head eliminates water seepage . . . reduces maintenance.

6 Regularly manufactured from A.I.S.I.C-1115. Can be made from higher carbon steels or alloys if necessary.

SEALTITE LAG SCREW

SEALTITE CAR BOLT


SEALTITE HOOK BOLT

SEALTITE TIMBER BOLT

SEALTITE WASHER NUT

LOCKTITE NUT

The Northern Pacific Railway along with 80% of America's Class One railroads specify one or more Sealtite products for car construction, bridges, trestles, and all types of timber construction and maintenance.

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terior space. Among the features of movable metal partitions discussed are economy, architectural design, structural stability, adaptability to changing space needs, sound control and provisions for easy electrical wiring.—THE MILLS CO., 975 WAYSIDE ROAD, CLEVELAND 10, OHIO.

Lightweight Spreader—A circular gives data and illustrations concerning a new lightweight bituminous spreader used for laying plant mix bituminous paving materials for roads, parks, streets, playgrounds, airports, sidewalks, driveways and tennis courts. The spreader is towed behind a dump truck which feeds the materials into the spreader box, and preliminary compaction is obtained by adjustable rollers attached to the rear of the spreader itself.—I. J. OVERMAN MFG. CO., 3301 SOUTH TORRANCE ST., MARION, IND.

Engineer's Transits—Two-color reproductions of an engineer's transit are available free. The 18x24-in. cardboard-mounted photographs are laminated and ready to hang. They were prepared especially for classrooms, libraries, offices, etc., and are particularly suited for visual education training and display purposes—THE DAVID WHITE CO., 315 W. COURT ST., MILWAUKEE, WIS.

Stainless Tube Fitting—Sta-Union, a threadless stronger and tighter union for joining stainless steel tubing, is described in an illustrated sheet. This product makes possible the use of light or heavy gauge tubing in place of pipe, thus reducing both weight and cost. This improved fitting is recommended for working pressures up to 150 psi.—STEEL PRODUCTS CORP., 52 VANDERBILT AVE., NEW YORK 17, N. Y.

Four-Fuel Engines—Industrial engines and equipment for their operation on gasoline, kerosene, distillate or natural gas in a wide variety of applications, are described and shown in a new 12-page catalog covering four carburetor-type engines. Models presented are available as stripped engines or with job-determined equipment combinations up to complete power unit. Maximum working horsepower ratings range from 24 to 55 for power units complete with fan, radiator, air cleaner, governor, when operating on gasoline.—INTERNATIONAL HARVESTER CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

Lathe Accessories—More than 130 different attachments and accessories for South Bend lathes and drill presses are illustrated and priced in a 28-page

Greatest Advancement in Power Shovel Design in 25 Years

The OSGOOD AIR-CUSHION CLUTCH*

Measured in terms of operating efficiency, dependability and economy, the new OSGOOD Air-Cushion Clutch is the greatest advancement in power shovel design in 25 years. It completely eliminates jerking and grabbing . . . provides fast, velvet-smooth action that permits accurate control of loads at all times and reduces wear on both men and machines.

The OSGOOD Air-Cushion Clutch combines the best features of the disc-type clutch with all the advantages of direct air engagement, and provides the simplest, most trouble-free method ever designed for applying air pressure. There is only one working part —no intricate system of cams, levers, bolts, pistons or valves. Adjustments are seldom necessary. And this clutch automatically compensates for wear on clutch linings. It's another OSGOOD "FIRST" that means faster production and more profits for you.

Write for details about how this exclusive OSGOOD feature can save you money.

*PATENTED U. S. PATENT OFFICE

POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

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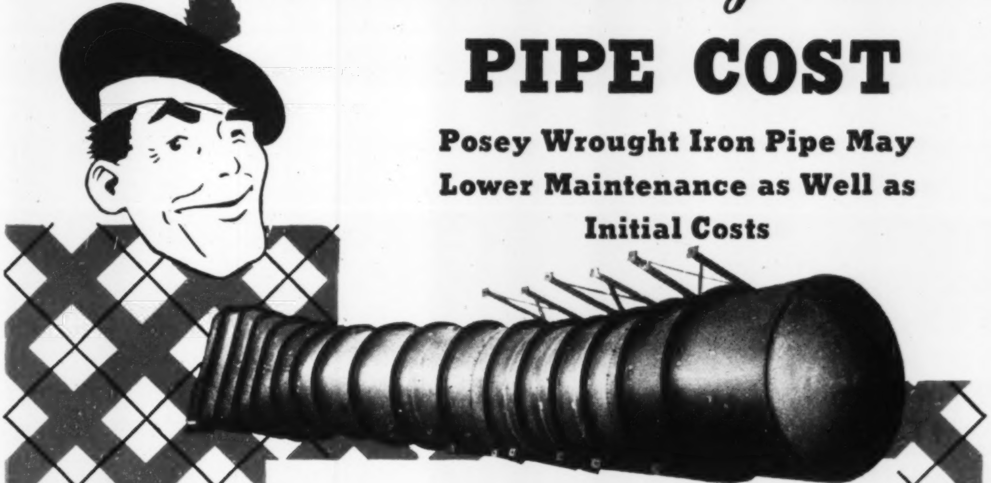
Posey Wrought Iron Pipe May Lower Maintenance as Well as Initial Costs



Whether your requirements are "run-of-the-mill" . . . or whether they involve unusual problems in pipe design and installation . . . a Posey estimate may be your first step toward a worthwhile economy. You can *save* not only at the time you purchase . . . but over and over again throughout the long, *low-maintenance* life of Posey Wrought Iron Pipe.

At the Posey Iron Works—established since 1910—experience has eliminated needless, cost-boosting fabrication steps . . . while improving flow capacity and holding pipe diameters and trench depths to a minimum. Maintenance costs are also reduced because durable Posey construction resists time and pressures . . . because tight Posey joints seal out roots.

Write Posey and state your service conditions. Our study of them may permit us to point out definite economies. No obligation, of course.

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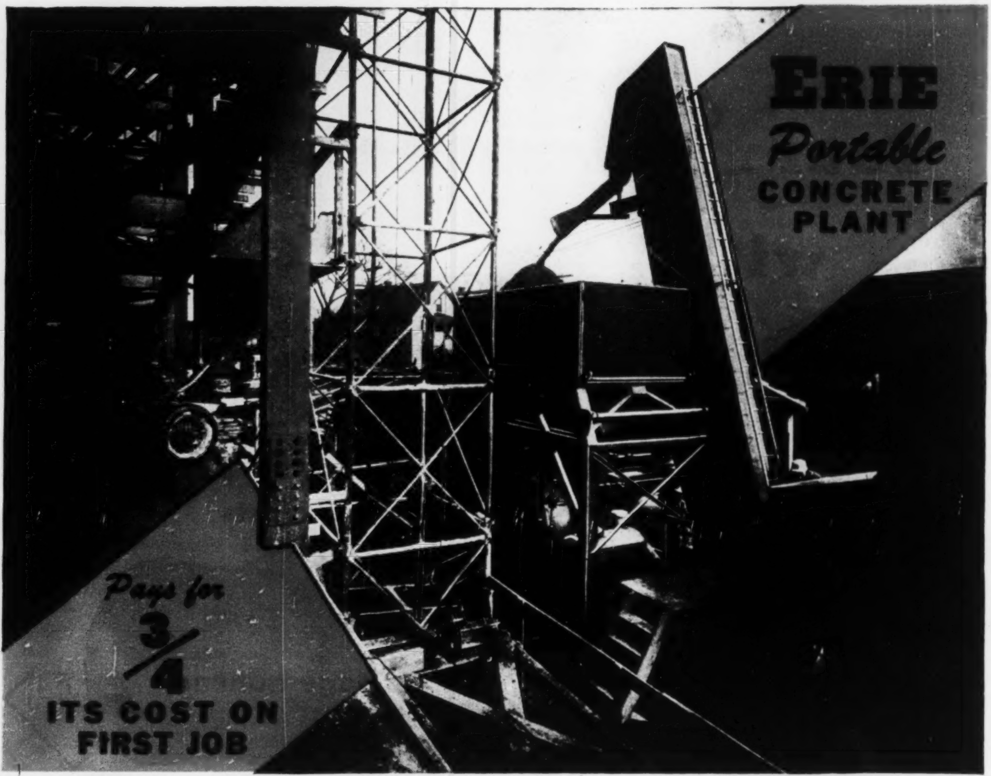
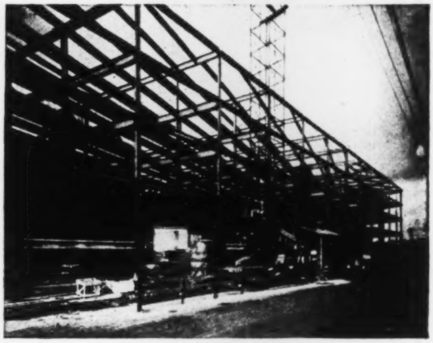
DIVISIONS Steel Plate · Asphalt · Steel Form · Brick Machinery



SIEGFRIED CONSTRUCTION CO. *Making Concrete on the Job* **AT TRICO PLANT, BUFFALO, N. Y.**

5 FLOORS • 5000 YDS • HIGH TEST CONCRETE

THIS Erie Portable Concrete Plant discharges each 1 yard batch to tubular tower, keeping buggy gang moving at top speed just behind the form builders and reinforcing bar teams. Aggregates are hauled 9 miles. Bag cement is stored under cover at the machine. One man operates weigh-batching of aggregate and water. Hydraulic control of all gates permits finger touch action. Second man feeds bag cement and supervises aggregate unloading to truck hopper which discharges to 60 ton/hr. vertical bucket elevator. Owner reports "a substantial saving on concrete laid will be effected on this 5,000 yard job". *Mounted on 8 pneumatic tires the plant can be quickly knocked down and towed to the next job.* Let's have your concrete making problem.



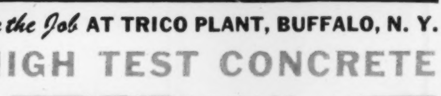
General view of Trico Plant showing 2nd floor of concrete being laid. The Portable Concrete Plant next to the building does not obstruct traffic.

Write for specific data on the Erie Portable Concrete Plant for your work.

ERIE

STEEL CONSTRUCTION COMPANY

595 GEIST ROAD • ERIE, PENNSYLVANIA



catalog, including some recently developed attachments. Although these attachments and accessories are designed primarily for use on South Bend machine tools, many of them can be easily adapted to other makes—South Bend Lathe Works, 361 East Madison St., South Bend 22, Ind.

Architectural Troffers—"The Troffer that Adjusts After Installation" is the title of a new booklet showing in detail the many features of shallow and deep troffers. It explains clearly the function of the aligner hanger, a development that permits levelling and adjusting of the troffer *after* installation has been completed. The methods of installing the troffer in various ceiling constructions are shown, together with additional Smithcraft developments, such as the plaster frame, slip-on trim flange, and duocam hangers—Smithcraft Lighting Division, Chelsea 50, Mass.

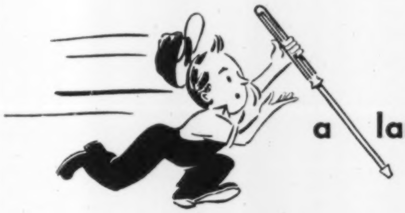
Concrete Mixtures Manual—(70-p. booklet) "Design and Control of Concrete Mixtures" presents basic information on how to produce quality concrete which should be helpful to every engineer and construction man. The publication comprises 12 chapters dealing with a range of topics including: Fundamental Facts about Concrete, Materials (cement, mixing water, aggregates and admixtures); Design of Concrete Mixtures; Measuring Materials; Mixing Concrete, Field Control Tests; Handling and Transporting Concrete; Placing Concrete; Joints; Curing and Protection; Removal of Forms; Finishing; Special Types of Concrete; Specifications and Tests. Here in only 70 pages is a comprehensive summary of essential information for users or designers of concrete. The presentation combines clarity with conciseness, and the text matter is complemented by drawings, tables and photographs. This booklet answers the questions of those seeking how to produce strong, durable concrete by proper selection and proportioning of materials, and how best to transport concrete and place it in forms.—Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill.

Heavy-Duty Bucket Loaders—(12-p. pamphlet) gives principal specifications of various models of Haiss heavy-duty bucket loaders equipped with integral swivel belt-conveyor discharge, and describes and illustrates with large pictures advantages of various applications of this type of materials loading. Circular is identified as No. SBC-1048. —Pettibone Mulliken Corp., 4700 W. Division St., Chicago 51, Ill.

Here's all you need to repair a KENNEDY SAFETOP after collision damage . . .

Only one man with

a socket wrench



a large screwdriver

a light sledge hammer

one collision breakage repair kit (breaking ring, coupling, 2 pins, gasket)

and 30 minutes

More and more communities standardize on KENNEDY SAFETOP Fire Hydrants because SAFETOPS are proved dependable under the most rigorous conditions . . . and because SAFETOP maintenance and repair features are simplified for greater economy and efficiency.

Write for Bulletin 62 describing *all* the details of the KENNEDY SAFETOP'S design and construction. No obligation!

THE KENNEDY VALVE MFG. CO.
1066 EAST WATER ST.
ELMIRA, NEW YORK
VALVES • PIPE FITTINGS • FIRE HYDRANTS

OFFICE-WAREHOUSES IN NEW YORK, CHICAGO, SAN FRANCISCO • SALES REPRESENTATIVES IN PRINCIPAL CITIES

$5.07 saved a contract ...and a man's business

Special switches were needed to complete an electrical instrument contract. Late delivery of finished items would kill chances of future orders and lay off men. Switches were 1100 miles away, but Air Express delivered the 15-lb. package at 3 A.M. — 8 hours after pick-up. Cost, only $5.07. Air Express now used regularly. Keeps down inventory, improves customer service by early delivery.

Low as $5.07 was, remember Air Express rate *included* door-to-door service, receipt for shipment and more protection. It's the world's fastest shipping service that *every* business uses with profit.

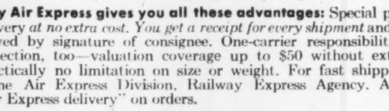
World's finest Scheduled Airline fleet carries Air Express. 24-hour service — speeds up to 5 miles a minute. Direct to over 1000 airport cities; air-rail for 22,000 off-airline offices.

FACTS on low Air Express rates:

17-lb. carton of hearing aids goes 900 miles for $4.70.
12 lbs. of table delicacies goes 600 miles for $2.53.
(Same day delivery in both cases if you *ship early.*)

Only Air Express gives you all these advantages: Special pick-up and delivery *at no extra cost. You get a receipt for every shipment* and delivery is proved by signature of consignee. One-carrier responsibility. Assured protection, too—valuation coverage up to $50 without extra charge. Practically no limitation on size or weight. For fast shipping action, phone Air Express Division, Railway Express Agency. And specify "Air Express delivery" on orders.

SPECIFY AIR EXPRESS
GETS THERE FIRST



Rates include special pick-up and delivery door to door in principal towns and cities

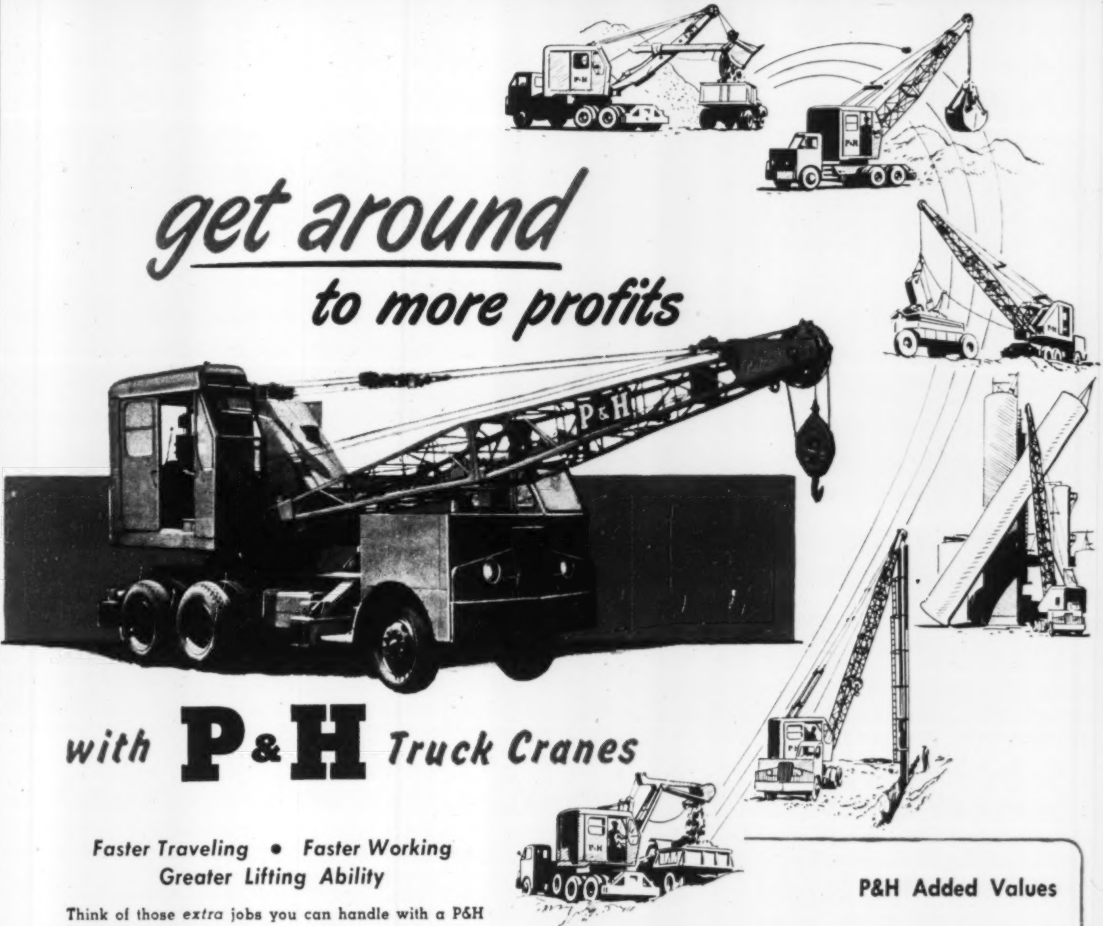
AIR EXPRESS, A SERVICE OF RAILWAY EXPRESS AGENCY AND THE
SCHEDULED AIRLINES OF THE U.S.

Manufacturers' Activities

Sales—KAISER CO. INC., has moved its eastern sales office to 620 Fifth Ave., New York City, N. Y., W. F. Pelletier in charge. . . Thos P. McNiesh, sales representative of HEWITT RUBBER div., HEWITT-ROBINS, INC., has been assigned to the Los Angeles territory, and H. S. Derkin to Chicago. . . . Donald Williams has been promoted from general sales manager to director of sales, the DOW CHEMICAL CO. . . . DETROIT DIESEL ENGINE div., G.M.C. announces A. E. Bosetti is sales engineer in the New York-New England zone; Paul Merkert in Ind., Ia., Mo., Kan. and southeastern border counties of Ia.; L. H. Wells sales to mfgrs. in midwestern states not covered by Mr. Merkert; and R. V. Baxley has a field sales assignment in Ohio and southern peninsula of Mich. . . . E. A. ALTSHULER and ASSOCIATES, 1603 Cahuenga Blvd., Los Angeles, manufacturers agents, have added to their staff a marketing specialist and advertising designer . . . Victor Ladetto is sales manager and D. H. Sleeper, assistant, for the CONTINENTAL SCREW CO., New Bedford, Mass.

E. L. Lockman is manager of tank lining and roll covering sales for U. S. RUBBER CO. . . . Warren E. Moon is sales and service representative in southern Illinois for the D-A LUBRICANT CO., INC., Indianapolis, Ind. . . . A. F. Tomes is sales manager of the VALDURA DIV., AMERICAN-MARIETTA CO., Chicago paint mfgr. . . . John D. Eddy is vice-pres. and sales mgr. for DOW & CO. INC., Western N. Y. . . . Carter B. Hart is New England region dealer supervisor for ALLIS-CHALMERS . . . Geo. A. Spencer heads the Los Angeles sales office for AMERICAN NICKELOID CO., Peru, Ind. . . . Wade A. Eskridge is service manager of the TWIN DISC CLUTCH CO., Racine, Wis. . . . W. F. Hancock is eastern Wisconsin sales representative of R. G. LE TOURNEAU, INC.

E. W. Pat Smith is special asst. to the general sales manager of OWENS-CORNING FIBERGLAS CORP. . . . Ellsworth B. Bever has been promoted from purchasing to sales and estimating for ELIZABETH IRON WORKS, INC., Union, N. J. . . . Thirty members of the JOSAM-PACIFIC, western sales organization of JOSAM MFG. CO. of Cleveland, Ohio, and Michigan City, Ind., recently attended a 4-day conference in San Francisco . . . V. L. Snow is domestic sales manager of THE EUCLID ROAD MACHINERY CO., and



Faster Traveling • Faster Working
Greater Lifting Ability

Think of those *extra* jobs you can handle with a P&H Truck Crane . . . and the *extra* profits it makes possible.

The P&H Truck Crane, wholly built by P&H, truck and all, can handle a lot more on the hook . . . and with other front end equipment has more digging power at the tooth point.

You have dual power . . . an engine built for travel and a second engine for sustained hard work.

Ask any P&H Truck Crane owner and you'll understand why it is his biggest money maker. Get the full story. Write for literature today!

P&H Added Values

- Hydraulic control—a new peak in operating ease and safety.
- Greater stability—with exclusive torsion bar-mounted front axle and lower center of gravity.
- Independent planetary boom hoist — raises or lowers crane boom smoothly and safely, with or without load.
- Planetary load lowering — permits "inching" of loads accurately.
- All-welded construction — greater strength.

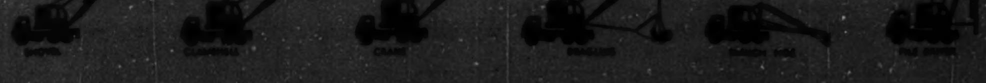
Size for size no P&H Truck Crane has ever been outlifted

P&H REMOTE CONTROL with this unit you can control all functions (even the horn!) by electric push-buttons — from the operator's position inside the crane cab.

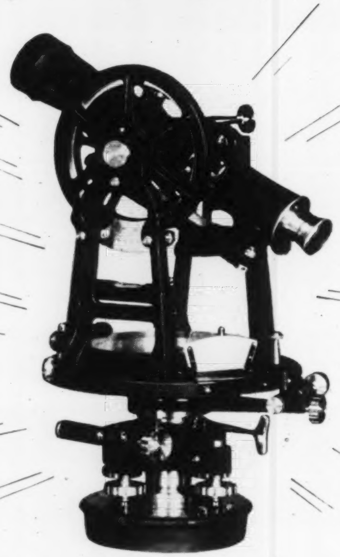
P&H

TRUCK CRANES
4404 West National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER
CORPORATION
EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS



Back Again by Popular Demand



THE FAMOUS DAVID WHITE

Western Reconnaissance Transit

HERE IT IS — back in production at your numerous requests — and with many improvements. The Western Reconnaissance Transit, while moderate in price, is a high quality instrument particularly designed to serve many engineering and surveying purposes. While capable of distant focusing, it can also be used for close work, giving versatility.

No desirable features have been overlooked in the construction of the "Western." It is a standard instrument of precision, of the same exacting construction as our Engineers' Transits, yet offering a saving well worth while.

SPECIFICATIONS — No. 7064 TRANSIT

TELESCOPE: 9¼" achromatic terrestrial. *Coated optics. Objective lens* with effective aperture 1.141" — *Internal focusing*, erecting eyepiece with improved spiral movement for stadia wires. Magnifying power 20 diameters. Stadia wires fixed ratio 1:100 reading direct from center of instrument, the constant (f+c) being negligible. Ground spirit level to telescope, graduated 5" long; sensitiveness 60 seconds. Improved Clamp and Tangent Screw with counter spring.

VERTICAL CIRCLE: 4" diameter graduated to ½ degrees on solid silver, with double direct vernier reading to one minute, with removable aluminum guard to circle.

COMPASS: Gold plated needle about 3¾". Compass ring beveled graduated on solid silver to half degrees and numbered in quadrants. Compass box watertight, with variation ring.

HORIZONTAL LIMB: 5-5/16" diameter. Graduated on solid silver to ½ degrees, numbered 0°-360° in two ways, with double-direct vernier reading to one minute, with ivory hinged reflector — too fine spirit levels, sensitiveness about 75 seconds.

CENTERS: Bronze anti-friction alloys, extra long and accurately fitted. Shifting center. Improved clamp and tangent, clamp and leveling screws of nickel silver.

FINISH: Black morocco enamel and lacquer.

EQUIPMENT COMPLETE: With strong aluminum base plate, sun shade, plumb bob, magnifying glass, adjusting pins, screw driver, oil can and brush, packed in fine polished hardwood case. Full length split leg tripod, 3½" 8 thread standard.

WEIGHT: Instrument 10 lbs., tripod 11½ lbs. *Note: Extension leg tripod No. 9070 extra.*

DAVID WHITE COMPANY

Write for name of your nearest dealer or contact us direct.

315 W. Court St.
Milwaukee 3, Wis.

J. W. Bloomquist is assistant sales manager . . . Charles L. Campbell, manager of the Philadelphia district of the REPLACEMENT TIRE SALES division of THE B. F. GOODRICH CO., has been appointed sales development manager of the eastern division, the Albany, Boston, Buffalo, New York City, Pittsburgh and Philadelphia districts. He is succeeded by L. O. Veith, who had been manager of the Harrisburg retail store . . . MOTOROLA, INC., has opened a second region in the New York-New England area. P. R. Kendall will be regional manager for Me., N. H., Vt., and N. Y. state, except N. Y. metropolitan area. L. E. White will be manager there and in R. I., Conn. and N. J. . . . Wm. A. Clayton is eastern district sales mgr. for the construction machinery division of the Chain Belt Co. of Milwaukee, Wis.

Distributors—GIBBS CORP., P.O. Box 4188, Jacksonville, Fla., is distributor for BUCYRUS-ERIE excavators and HYDROCRANE in north-central Florida . . . BORNELL SUPPLY CO., INC., 180 East Main St., Piqua, Ohio, is distributor of HEWITT industrial rubber products in Piqua and surrounding territory . . . PAUL M. COLE CO., 30 N. LaSalle St., Chicago 2, is national and international distributor for LITTLE GIANT cranes and shovels of the DES MOINES DRAGLINE SERVICE.

ARO SALES & SERVICE, INC., is distributor for ARO products of the ARO EQUIPMENT CORP., Bryan, Ohio, on the Pacific coast. The office in San Francisco is at 766 Brannan St. . . . MIDWESTERN ENGINES and EQUIPMENT CO., Tulsa, Okla., has become a distributor for the construction equipment of the WORTHINGTON PUMP and MACHINERY CORP., Harrison, N. J.

Personalities—Frank W. Fox, of GOODYEAR TIRE & RUBBER CO.'s truck and tractor tire div., recently completed 35 years service with the company . . . O. A. Kirkland is mgr. for the N. Y. district for the GENERAL ELECTRIC CONSTRUCTION MATERIALS dept. . . . Robt. L. Baldwin is asst. to G. A. Wallerstedt, western dist. mgr. for HARDINGE CO. . . . G. S. Brown elected honorary chairman of the directors, F. G. McKelvy, chairman, and J. F. Magee, president of ALPHA PORTLAND CEMENT CO., Easton, Pa.

T. C. Gerber is director of the PIPE JOINT div. of the GATES ENGINEERING CO., New Castle, Del. . . . H. Lloyd Nelson, eastern sales mgr. of the U. S. PIPE and FOUNDRY CO., Burlington, N. J., has been granted a leave of absence to be president and general operating mgr. of the PONTUSCO CORP. and the PONTUSCO CORP. of Cuba . . . Allen D. MacLean has become chief engineer of the CHAPLIN-FULTON

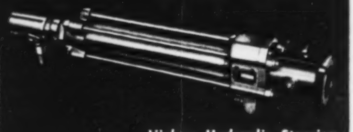
Swinging the Big Sticks with

VICKERS Hydraulic POWER STEERING

GERLINGER MATERIAL CARRIER

Another Cost-Cutting Application of VICKERS HYDRAULICS

VICKERS HYDRAULIC POWER STEERING *is Effortless, Positive, Shockless*



Vickers Hydraulic Steering Booster with Integral Overload Relief Valve. Bulletin 47-30a.

Vickers Balanced Vane Type Pump is Engine Driven. Bulletins 36-12 and 49-52.

Vickers Hydraulic Power Steering makes it easier and cheaper to handle logs and large piles of lumber with the Gerlinger Material Carrier. Four Wheel Steering is effortless in spite of very heavy front wheel loading. The quick, easy maneuverability speeds operation . . . substantially lowers materials handling costs.

Not only is Vickers Hydraulic Power Steering effortless and safe, it also avoids load on the conventional steering gear. Steering force reaction is absorbed by the vehicle frame . . . road shock does not reach the steering gear.

Vickers Hydraulic Power Steering is saving money for the users of carriers, trucks, road machinery and other mobile equipment . . . not only by speeding operation, but also by reducing driver fatigue. For detailed information, ask for Bulletin 47-30a.

VICKERS Incorporated
DIVISION OF THE SPERRY CORPORATION
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Application Engineering Offices:
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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

Planning a Trestle Bridge?

. . . cut design, construction and maintenance costs with a

KOPPERS

"Made-to-Measure" Bridge*

● Your savings *start* in the drafting room! Various types of abutment, bent, deck and railing bridges are detailed, dimensioned and blueprinted in Koppers "Made-to-Measure" Bridge Book. Select the types desired; then, on a data sheet, provide certain essential information as to dimensions and site; send to Koppers for a quotation. Your project can reach the quotation stage in a fraction of the time, and with substantial reduction of the preconstruction expense usually required.

Your savings *continue* through construction! By standardizing parts and dimensions, bridge members can be framed, treated and shipped to the job site all ready to be assembled. Erection can be made by highway crews plus local labor. No special equipment is needed.

Your savings *continue* through the years! Bridge members are made of standard grades of wood—wood that has been properly seasoned, then pressure-treated. This pressure-treatment protects the wood against decay . . . assures maximum life with minimum maintenance.

**With the use of rolled I beams and pressure-creosoted construction, it is possible to have clear spans up to 76'.*

"Made to Measure"
HIGHWAY TRESTLE BRIDGES
of Prefabricated
Pressure-Treated Timber
K
KOPPERS

If you are interested in trestle bridge construction, send for a free copy of Koppers "Made-to-Measure" Bridge Book.

KOPPERS PRESSURE-TREATED WOOD

KOPPERS COMPANY, INC., Pittsburgh 19, Pa.

Mfg. Co., manufacturers of valves and pressure regulators . . . Fred F. Bartel has become engineer for the Tews Lime and Cement Co., Milwaukee, Wis. . . . Frank B. Brown is managing director of the Wire Reinforcement Institute, Washington, D. C., Alfred S. Osbourne and Louis A. Mertz have been elected directors of Dravo-Doyle Co., Pittsburgh . . . The Black & Decker Mfg. Co., Towson 4, Md., announces that R. A. Lomas, service engineer at Seattle, has been transferred in similar capacity to the Los Angeles branch to supervise all service activities in Southern California on Black & Decker, Van Dorn, and Home-Utility portable electric tools. G. S. Ellis has been promoted to service engineer at Seattle . . . Charles Lukens Huston, Sr., a steel executive in his 74th year of continuous service with Lukens Steel Co., has been honored by the board of directors, American Iron and Steel Institute, New York. He was elected an honorary member of the institute. Mr. Huston, now in his 93d year, and first vice-president of Lukens, started with the company at Coatesville, Pa., Dec. 15, 1875, as a clerk and bookkeeper . . . Willis Haviland Carrier, chairman emeritus of Carrier Corp., was honored at a testimonial dinner at Syracuse, N. Y., April 13 by the North American Branch of the Newcomen Society of England as "The Father of Air Conditioning."

Deceased — Robt. McDougle, 80, president of the Maryland Car Wheel Co., died in Chicago, April 10 . . . Wm. R. Jones, 72 general manager of the Jones Bros. Structural Steel Co., Ravenna, Ohio, died April 15 . . . C. Neal Barney, 73, vice-pres., secy. and general counsel of Worthington Pump and Machinery Corp., died at Scarsdale, N. Y., April 24 . . . Samuel E. Brams, 63, president and general manager, Copperweld Steel Co., Pittsburgh, died at Daytona Beach, Fla., recently . . . Raymond A. Mooney, 60, N. Y. State dist. sales mgr., Huron Portland Cement Co., died in Buffalo, N. Y., April 13 . . . Archibald M. Maxwell, 54, director and vice-pres. in charge of refinery sales, the Standard Oil Co., of Ohio, died at Cleveland, April 18.

Miscellany—Kwikset Locks, Inc., rebated thousands of dollars to customers who bought Kwikset locks in March just prior to the April 1 price reductions . . . Cochrane Corp., Philadelphia, has acquired practically all of the capital stock of Liquid Conditioning Corp., Linden, N. Y. . . . Lake Shore Engineering Co., Iron Mountain, Mich., has formed a conveyor div. to make and sell Tote-All

Above photos show New Holland Double Impeller Breaker installation at Hudson Stone Products Company; also . . . actual size material as it comes from delivery conveyor before screening. Notice uniformity of shapes and sizes. This is the result of "Dual Impact" action! Breaking force evenly distributed assures accurate sizing without irregular shapes—even with slabby material!

says
TOM HUDSON, owner,
Hudson Stone Products Company,
Lynchburg, Ohio

In limestone . . .

"Crush more material to desired size with less power"

● Early in 1947, Tom Hudson modernized his plant. He replaced three units with a single New Holland Model 3030 Double Impeller Breaker.

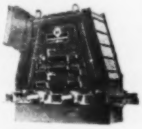
From the layout of his plant which is indicated above, you can easily see what Mr. Hudson means when he says . . .

"A one-crusher plant can be successfully built around this crusher (the New Holland Double Impeller Breaker) . . . which permits a minimum of other equipment . . . contributes materially toward low maintenance."

In pits and quarries all over the world, "Dual Impact" action is producing outstanding results.

The record is the same . . . higher production at lower cost . . . in limestone, basalt, granite, gravel, and many other types of stone.

New Holland Double Impeller Breakers are available in four sizes—1212, 2020, 3030, 5050—to meet your requirements. They can be adapted easily to either an open or a closed circuit.



Whatever your crushing problems—bring them to New Holland engineers. They will help you as they have helped so many other operators. Write Department E-59 today.

NEW HOLLAND DOUBLE IMPELLER BREAKERS

NEW HOLLAND MANUFACTURING COMPANY, MOUNTVILLE, PA.

CALGARY
ST. JOHN
SAN DIEGO
RIO DE JANEIRO

From Calgary to Rio . . .
St. John to San Diego . . . . . .

It's LOCK JOINT

Throughout the Western Hemisphere, Lock Joint has established its reputation as the pressure pipe of unfailing service.

Lock Joint pressure pipe is supplied in four tested and proved designs, perfected through constant research.

★ ★

REINFORCED CONCRETE PRESSURE PIPE
REINFORCED CONCRETE CYLINDER PIPE
PRESTRESSED CONCRETE CYLINDER PIPE
REINFORCED CONCRETE SUBAQUEOUS PIPE

★ ★

Whatever your water supply line problem may be, one of these four standard Lock Joint designs is certain to satisfy your requirements and give lasting service.

Made in all standard diameters from 16" to 150", Lock Joint Pressure Pipe is designed for all pressures common to American water works practice.

You are invited to inquire at any of our offices for complete information.

SCOPE OF SERVICES—Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

LOCK JOINT PIPE COMPANY
Est. 1905
P. O. Box 269, East Orange, N. J.

PRESSURE PIPE PLANTS: Wharton, N. J., Turner, Kansas
BRANCH OFFICES: Cheyenne, Wyo. • Denver, Colo. • Kansas City, Mo. • Valley Park, Mo. • Chicago, Ill. • Rock Island, Ill. • Wichita, Kan. • Kenilworth, N. J. • Hartford, Conn.

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

and **Coaltoter** light weight, power-driven portable belt conveyors . . . Additions costing about $325,000 are being completed at the Salt Lake City plant of the **Chicago Bridge and Iron Co.**

The McLean Co., 3525 Lakeside Ave., Cleveland, held open house April 29 in its new office, service headquarters and warehouse. It is exclusive distributor for **Barber-Greene Co.** . . . **Nicholson & Galloway, Inc.**, roofing and waterproofing, building restoration, 126 E. 110th St., New York 29, N. Y., is celebrating its 100th anniversary this year . . . F. H. Boor, for 23 years chief engineer of the **Fairfield Mfg. Co.**, Lafayette, Ind., has resigned to give full time to the technological study of gears . . . **Marsh Wall Products, Inc.**, has become a subsidiary of **Masonite Corp.**, Chicago.

Arrangements for the sale of patented Nelson stud welding guns, gun parts, patented ferrules, and patented flux-filled studs to **KSM Products Corp.**, of Merchantsville, N. J., for resale by them in the United States, have been completed by the **Nelson Stud Welding** division of **Morton Gregory Corp.** . . . **Canadian SKF Co.**, Toronto, has bought 40 acres in the suburbs to build a $1,000,000 plant with an initial 60,000 sq. ft. floor space unit . . . First "pigs" of virgin aluminum were poured April 15 from the newly opened pot line at the **Reynolds Metals Co.**'s Jones Mill, Ark., plant . . . **The Baldwin Locomotive Works** has announced a price reduction equivalent to 5% on its line of diesel electric locomotives . . .

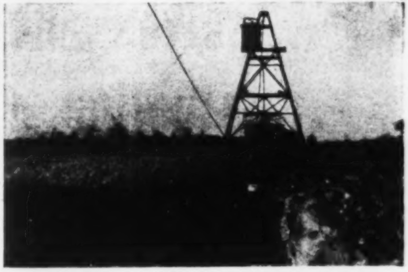
Okonite Co., is opening a new office at 1505 Tower Petroleum Bldg., Dallas, Tex., with O. W. Herring as manager . . . On June 23 a new stainless steel wire mill will be opened at **American Steel & Wire Co.**'s works at Waukegan, Wis. It will have a capacity of 500 tons a month . . . **Goodall Rubber Co.**, Trenton, N. J., has opened a branch sales office at 1033 Santa Fe Drive, Denver 4, Colo. . . . **F. C. Russell Co.** at its Herman Ave. plant, Cleveland, Ohio, will produce vertical slide windows for new construction. The windows will be packaged in completely assembled units.

Nearly two-thirds of the funds have been pledged for the **Structural Clay Products Industry**'s million-and-a-quarter dollar research program, W. J. Goodwin, Jr., president of the **Structural Clay Products Institute**, has announced . . . **Samuel and Hirshberg**, 204 Valentine Street, Hackettstown, N. J., have acquired the manufacturing rights of a complete line of paint line-striping machines for industrial plants, highway and street use, formerly manufactured by the In-

BOOST YOUR DAILY YARDAGE—

on Deep Cuts and Long Hauls

WITH A
Sauerman
POWER DRAG
Scraper



Sauerman Scraper with self-propelled tower digs a borrow pit 800 ft. wide and builds a high levee in one operation. Moves and places 500 cu. yd. an hour.

Regardless of the type of material you're handling—clay, sand, gravel, boulders, light or heavy bulk material—a Sauerman Scraper will work in a quick, continuous cycle of operation digging big loads and moving these loads at high speed. The Scraper travels back and forth over any kind of ground, on hillsides, in pits or under water to save time, money and manpower.

One easily trained man completely controls the operation and takes care of the small amount of maintenance. Only a few parts come in contact with the material being worked, so wear is slight. Installation cost is low and power consumption, Diesel, gasoline or electricity, is very small on the basis of tonnage handled.

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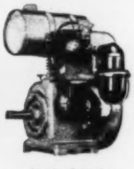

Single Cylinder, 2 to 9 hp.

- Heavy-Duty, long term service . . .
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- Full load power delivery on a continuous service basis if that's what the job calls for . . .
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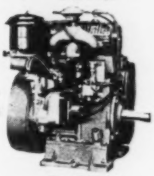
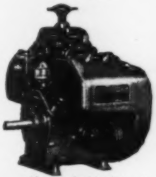
- Your choice of power to fit the machine and the job in 4-cycle single cylinder, 2-cylinder and 4-cylinder engines, in a power range from 2 to 30 hp.

Let us supply you with full details, including engineering data applying to your specific power problems.



Two Cylinder, 7 to 13 hp.



V-type 4-cylinder 15 to 30 hp.

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WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 14, WISCONSIN

Gas cutting & arc welding solves another fabrication problem

AKWELD CORPORATION of Brooklyn, New York, manufacturers of fuel oil tanks, was approached by a customer for help in solving a difficult problem. The customer had experienced delay in getting several types of large steel fittings required for a natural gas pipe line running into a new compressor plant and asked Akweld to fabricate these fittings.

Jack Saunders, Airco Technical Sales Representative, assisted Akweld in making up the required fittings from steel plate. The sections were first cut from ¼″ and 5/16″ thick stock, with an Airco Number 10 Radiagraph gas cutting machine; then rolled into shape and fabricated with Airco Number 90 electrodes.

In all, 50 fittings were made, ranging in diameter from 8 inches to 50 inches. The photograph above shows one of the larger fittings being welded. Note how the flange is backed up to control distortion. As a result of their success with this job Akweld received an order to fabricate more of those special steel fittings from another concern.

• • • •

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To assure its customers of high efficiency in all applications of the oxyacetylene flame or electric arc, Air Reduction has available the broad, practical experience of its nationwide Technical Sales Division personnel. The collective experience and knowledge of these specialists has helped thousands to a more effective use of Airco processes and products. Ask about this Airco "Plus-Value" service today. Write your nearest Airco office. (In Texas: Magnolia Airco Gas Products Company . . . On West Coast: Air Reduction Pacific Company.)

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Offices in Principal Cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Cutting Machines . . . Gas Welding Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

DUSTRIAL TOOLS and PRODUCTS CORP., Rochester, N. Y. . . . BE-GE MFG. CO., Gilroy, Calif., earth moving machinery, has established a factory in East Chattanooga, Tenn. . . . Completion of a new overall trademark design, featuring the brand name "PROTO", has been announced by M. B. Pendleton, president of the PLOMB TOOL CO., Los Angeles, Calif. . . . UNITED STATES PLYWOOD CORP. has purchased the Indianapolis warehouse of THE WILLIAMS PLYWOOD CO. and, effective immediately, and will operate it as a branch in its nation-wide system of distributing units.

Men and Jobs

Lewis L. Gwin, engineer of Blair County, Pa., and a World War II veteran, has become city engineer of Altoona, Pa., succeeding Chas. L. Fields, resigned because of ill health. Gwin is a civil engineer graduate of Pennsylvania State college. Since 1940 he has served continuously as county engineer except for three years as a sanitary engineer and medical inspector in the Army Engineer Corps during the war.

Brig. Gen. Gordon R. Young, engineer commissioner in the Washington, D. C., government, has reshuffled assignments of his three assistants. **Lieut.-Col. Lavonne E. Cox** will be in charge of the highways department, the department of vehicles and traffic, the office of the chief clerk of engineering department, and will be chairman of the parking space committee, and the safety committee. **Lieut. Col. Carlin H. Whitesell, Jr.**, will be in charge of the department of sanitary engineering, the offices of the water registrar, municipal architect and the department of correction. **Lieut. Col. Thomas J. Hayes, 3d,** will be in charge of the department of inspection and the surveyors' office. He will be chairman of the real estate committee, which handles purchases and sales of land for the District, and the board of condemnation of insanitary buildings.

New engineering employees with the New York State Department of Public Works are **Sam Anikstein** a recent graduate of the University of Illinois; **Domenic Massimilian,** a 1949 graduate of Purdue University; **John Kruegler** and **James Marinhugh,** 1949 graduates of Rensselaer Polytechnic Institute; **Andrew Tweedie,** a 1932 graduate of Cornell University; **Charles**

(Continued on page 97)

4 new photographic papers... provide unique advantages with standard reproduction equipment

For use in direct process and blueprint machines... *Kodagraph Autopositive Paper.* The *first* low-cost photographic intermediate paper . . . the *first* that produces positive copies directly—without the negative step . . . the *first* that can be exposed in your present machine and processed under normal lighting. With it you can preserve new drawings . . . restore old, soiled ones . . . obtain intermediates with dense photographic black lines on a clear translucent base—fast and durable in subsequent print making..."photo-lasting" in your files.

For use in contact photocopy machines . . . *Kodagraph Contact Paper.* Sparkling, more legible results—and lower costs—with this all-new, inexpensive paper. It reproduces your work in dense photographic blacks, brilliant whites. Processing is easier, surer . . . thanks to a non-curling base . . . extremely wide latitude . . . amazing uniformity from sheet to sheet, package to package.

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For use in enlargers, projection printers, process cameras . . . *2 Kodagraph Projection Papers.* You have this choice, now, whenever there's call for change-of-scale prints: *Kodagraph Projection Paper* . . . if you prefer plentiful safe-light illumination . . . and ample time to dodge prints. *Kodagraph Fast Projection Paper* . . . if maximum printing speed is preferred. Both papers are available in several thicknesses. Thus, you can produce reference copies, translucent intermediates, or durable ledger sheets. Whatever your choice, you always get sharp, flat-lying prints.

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Note the willing way it comes off the reel or coil. Here's where unpreformed rope too often meets with injury. But there's no twisting, no kinking, with *Preformed* Yellow Strand—and that goes also for Lang lay and Independent Wire Rope Center constructions. Pent-up stresses have been *relaxed* by preshaping wires and strands during manufacture.

Since the ends do not flare out, limber *Preformed* Yellow Strand can be threaded quickly through blocks and sheaves... attached easily to the drum ... socketed or fastened without distorting the parts. Smooth, even first-time spooling further shortens change-over delay.

Crowning all these time-saving advantages is the *longer life* of *preformed* rope which postpones replacements, keeps men and machines on productive jobs.

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HAND BOOK FREE: "Industrial Wire Ropes" contains useful facts, tables, pictures. Write for your copy.

BRODERICK & BASCOM
Yellow Strand
***PREFORMED* WIRE ROPE**

Pratt of Syracuse University; **James Alverson,** a 1929 graduate of Rensselaer Polytechnic Institute, and **Louis Gates,** who attended the University of Wisconsin.

Orville W. Chinn, hydraulic engineer, has been appointed director of the new flood control and water use division of the Kentucky state conservation department.

Horton Whipple and **S. K. Whipple** have formed a partnership for the practice of civil engineering under the firm name of Whipple Engineering Co., Palo Alto, Calif. The company is successor to Thomas and Whipple, also of Palo Alto.

Ralph T. Knutzen has been appointed Whatcom County Engineer at Bellingham, Wash., to succeed **Carl McCoy,** who had held the position on a temporary basis since **T. P. Scholz** resigned Jan. 1 to become Bellingham's city engineer. A 1928 civil engineering graduate of Washington State College, Knutzen worked for the state highway department until 1947, with the exception of four years during the war. His most recent position with the highway department was as resident engineer in the Bellingham area.

James D. Glover has been named resident engineer at Vidalia for the Georgia State Highway Department, succeeding **J. F. Vaughn.**

Edward E. Staib, Tiffin, Ohio, has been named to succeed **Jesse P. Meisner** as superintendent of maintenance for the Ohio Highway Department in Seneca County, a post he formerly held.

Donald D. Heffelfinger, Alliance, Ohio, has been employed by Columbiana, Ohio, as sanitary engineer, and will make a survey of the sewer system.

L. F. Martin of Missoula, Public Roads Administration engineer in Montana for 29 years and for the last 11 years chief of the Montana district, will retire June 1, to be succeeded by Karl Chamberlain, senior highway engineer for the PRA at Boise, Idaho. At one time Martin was an engineer with the Interstate Commerce Commission.

Stanford Eugene Harris, superintendent of the city water department at Goldsboro, N. C., has been appointed superintendent of the municipal water works and sewage department at Winston-Salem, N. C. Previously, he was superintendent of

BIGGER PAYLOADS with WELLMAN Williams Type BUCKETS

• Exclusive features in design and construction make payloads bigger...at lower cost! Weight is balanced, not cumbersome. Extra strength is built into every part with the sturdy **welded rolled steel construction** pioneered by Wellman, the leader for over fifty years. A type for every service!

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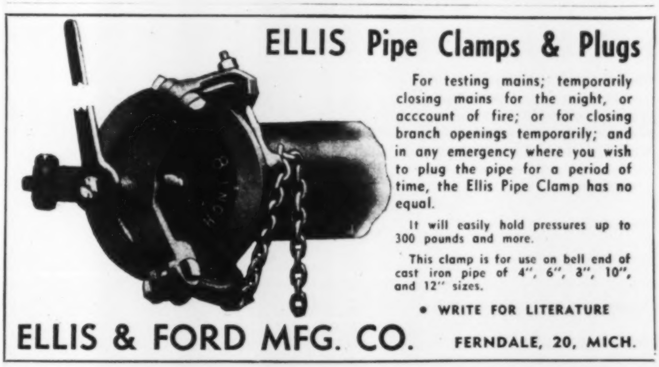
ELLIS Pipe Clamps & Plugs

For testing mains; temporarily closing mains for the night, or acccount of fire; or for closing branch openings temporarily; and in any emergency where you wish to plug the pipe for a period of time, the Ellis Pipe Clamp has no equal.

It will easily hold pressures up to 300 pounds and more.

This clamp is for use on bell end of cast iron pipe of 4", 6", 8", 10", and 12" sizes.

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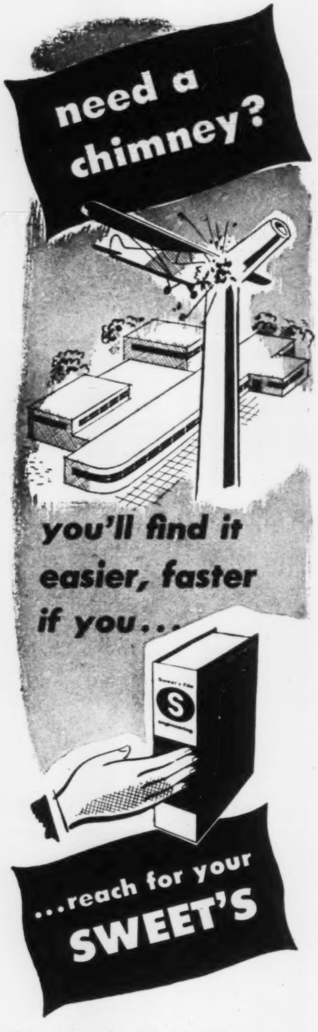
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you'll find it easier, faster if you...
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When you need specific information on materials, equipment or services, reach for your Sweet's File, Engineering (the big blue file). It contains 330 manufacturers' catalogs full of useful information on thousands of products . . . from absorbers—gas, to zinc galvanizing. Cross indexing speeds finding.

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the water and sewerage departments at Lenoir.

Frank T. Gleason, Theodore C. Cramer, and **Doris J. Gleason** have organized the Central Highway Corp., general contractors, with offices at 205 Harrison St., Syracuse 2, N. Y.

Paul D. Miller, formerly with the Toledo-Lucas County Plan Commission as a specialist on rail and water transportation problems, has joined the firm of Wernert, Taylor, Sanzenbacher & Morris, Toledo, engineers, as a consultant on city planning.

John T. Howard, Cleveland planning director since the formation of the present city planning commission in 1942, announced he would resign this spring to enter private consulting work in Cambridge, Mass. He intends to join with **Frederick J. Adams,** president of the American Institute of Planners and head of the department of city planning at the Massachusetts Institute of Technology, and **Roland B. Greeley,** a member of the city planning staff at M.I.T., in establishing a private consulting firm. Howard was educated at Antioch College, Yale University, and M.I.T., and had served as city planner from 1937 to 1942 with the Regional Association of Cleveland, and consultant in city planning for the Metropolitan Housing Authority from 1938 to 1940.

C. E. Tench of Blind River, Ont., has been elected county engineer of Renfrew County at Pembroke. Mr. Tench succeeds W. B. MacMullen.

Edwin M. Leonard has been named Fayette County engineer at Washington Court House, Ohio, succeeding the late Robert E. Willis. Leonard served as Gallia County engineer in Gallipolis, for 12 years.

H. E. Anderson, Alliance Ohio, former assistant state highway director, has been appointed Troy, Ohio, service and safety director, succeeding K. O. Peters, resigned.

C. W. Smedberg and **J. Garcia** of the John J. Harte Co. of Atlanta, Ga., have surveyed the municipal water and sewerage systems at Brevard, N. C., for expansion.

As a result of recent promotion examinations for engineers in the New York State Department of Public Works, **John Robertson, Frank Reid, Paul Smith,** and **Andrew Crowe** have received appointments as senior civil

(*Continued on page 101*)

Electroline — FIEGE
WIRE ROPE CONNECTORS

The LAST WORD in

SAFETY
SPEED
SAVINGS

No heat, acids or complicated equipment required for installation. Ordinary mechanic's tools do the job, safely, even in chemical plants, powder plants and mines, where other methods would be prohibited. And they are safe to use, because they have the highest holding strength of any known wire rope or strand connectors. They assure *savings in installation* because unskilled labor can do the job easily and quickly; *savings in use* because they prolong wire rope life by damping vibration and overcoming rope fatigue at entrance to fitting . . . and because they are reclaimable.

Note ease of installation

Send for new descriptive catalog

Simply slip the sleeve over the cable, spread the strands, insert and drive in the plug then apply the socket. See what a solid and permanent joint you have by looking at it through the inspection hole put there for the purpose.

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Hayward Buckets

Use this Class "E" Clam Shell Bucket for handling crushed stone, gravel, sand and other bulk materials.
THE HAYWARD CO., 48-50 Church St., N. Y.

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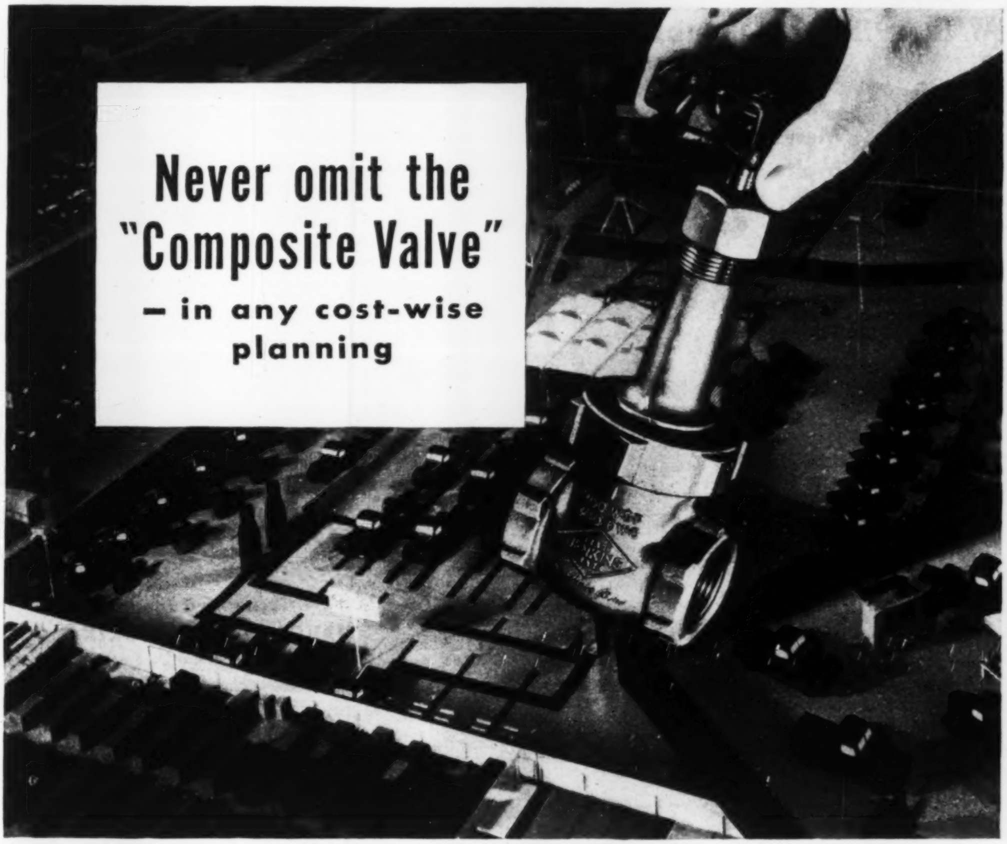

Never omit the "Composite Valve"

— in any cost-wise planning

CALL IT THE "COMPOSITE VALVE"—the giant that would result if *all* the valves in a plant were *one* valve. As pictured here, its proportion to other equipment in this detailed model of an automobile factory is fairly accurate. Representing your total valve investment, its size may surprise you, but it must be considered in any plan for economical plant operation.

IT PAYS to keep *your* "composite valve" in mind at all times . . . and thus avoid the common error of dismissing valves as a comparatively unimportant investment. With wages and material costs the highest ever, your total valve expense warrants the same careful attention that you give to operating costs of larger plant units.

EXCESSIVE MAINTENANCE of one inferior valve is insignificant, but multiplied by thousands, it is a serious drain on operating budgets. JENKINS BROS. helps you meet this problem two ways. First, by building extra endurance into Jenkins Valves, making them the longest-lasting, lowest-upkeep valves that money can buy. Second, with advice from Jenkins Engineers on any question of proper selection, installation, or maintenance.

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PRACTICAL PIPING LAYOUTS

"PRACTICAL PIPING LAYOUTS" is a 32-page book containing diagrams and descriptions of 25 basic piping layouts with complete recommendations for valve selection and location in the lines. Tells you "which valve where for best performance". FREE on request. Write JENKINS BROS., 80 White Street, New York 13, N. Y.

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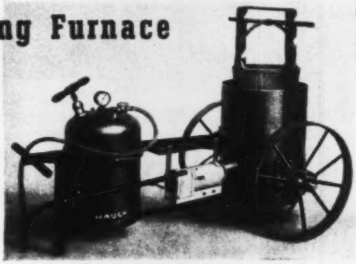

You Never Wait for Hot Lead

Melts 450 Lbs. Lead in 20 Minutes
Melts 200 Lbs. Lead in 10 Minutes

Clean, Intense, Controlled Heat. Powerful Oil Burner Requires 94% Air and only 6% Fuel

Hot metal with no stops for cleaning or feeding fires. Equipment easy to move. Heavy cast iron pot set on rack in heavy sheet steel furnace with roller bearing steel wheels. Burner equipment removable for other heating or melting jobs. Welded steel fuel tank with hand pump, oil-resisting hose, fittings and torch burner on "slide rail."

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Jointing Compound is Heated Fast or Slow

25 Gallon Furnace Melts in 8 Hour Day Enough Compound to Lay 2610 Ft. of 10" Cast Iron Pipe

Heats any pipe jointing compound, asphalt, pitch or protective coating enamel. One man operates and moves equipment unassisted. Heavy steel melting pot is set in heavy sheet steel furnace mounted on roller bearing wheels. Burner detachable for other heating jobs. Fuel tank of welded steel, with all fittings and oil-resisting hose.

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...for white or colored stucco...

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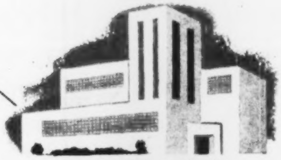

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as white as snow engineers, assigned to the Bureau of Bridges and Grade Crossings; **Arthur Moon** and **Andrew Carr** have become senior civil engineers assigned to the main office, Division of Canals; while **Joseph Kirchenbaum** and **Joseph McIlwaine** have become senior civil engineers assigned to the Division of Architecture in Albany.

Earl Riber, Dayton, has been named Montgomery County, Ohio, sanitary engineer.

Steve Gilbert has been promoted to superintendent of sewers in the Toledo, Ohio, city street division, succeeding **Clarence Clary**, who resigned to establish a sewer construction firm. Mr. Gilbert had served as superintendent of streets until Jan. 1, 1949.

Richard H. J. Martens is Scott County engineer at Davenport, Iowa.

Robt. M. Brown is county engineer for Wyandotte County at Kansas City, Kan.

Ronald Child is county engineer for Trama County at Toledo, Iowa.

Gwynne de Le Gro, former Wahkiakum County engineer at Cathlamet, Wash., has been appointed city engineer at Mount Vernon, Wash.

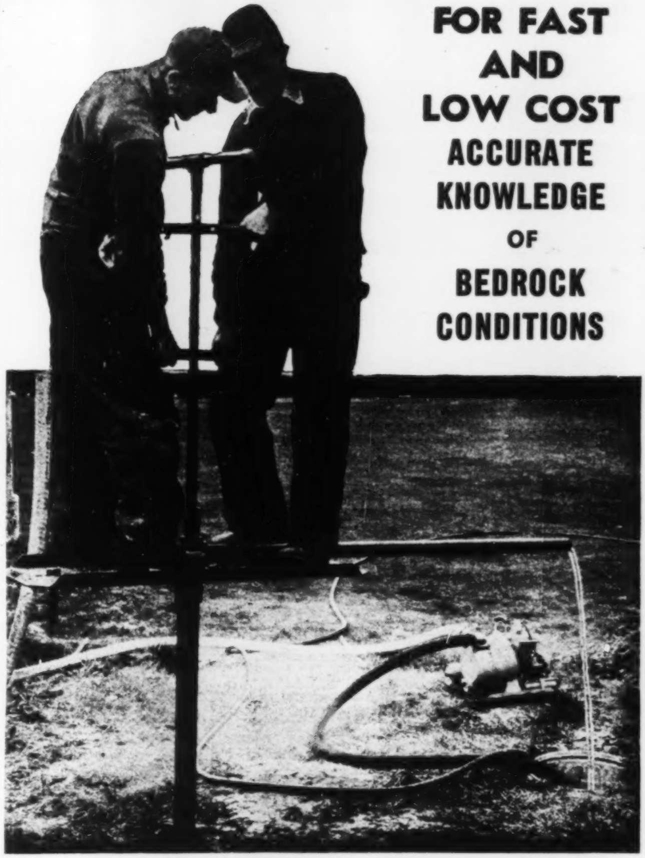
Edward F. Eldridge, chief engineer of the Washington State Pollution Control Commission since last July, has been appointed acting director. **Jack Taylor**, former director, has been elected state land commissioner.

John H. Harmon, El Dorado, Ark., former district engineer of the highway department, has been appointed director of highway maintenance and construction in District 7.

C. A. Nelson has been appointed city engineer of Springfield, Ill., succeeding **L. A. Lush**, who becomes Sangamon County superintendent of highways. A graduate of the University of Illinois, 1931, Nelson became assistant city engineer in 1939. He had 44 months service with the Corps of Engineers in the war and was discharged as a major.

T. D. Linton, former assistant district engineer of rural highways in Kentucky, has been made head of the highway department's 2d District office at Bowling Green, replacing **Lamar Riney**, who goes to Frankfort to be in the location section of the design division.

FOR FAST
AND
LOW COST
ACCURATE
KNOWLEDGE
OF
BEDROCK
CONDITIONS



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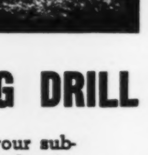
When you drill to bedrock you want to know your subsurface conditions—but at LOW COST. Here is the rig that you can transport and set up easily and economically in rough country, with a couple of men if necessary. Designed especially for this class of work. Extensively used by U. S. and State Governments and many others. Extremely strong and simple.

• *Easy to transport, setup, take down*

JUST THE DRILL FOR ROUGH COUNTRY

Outfit weighs only a total of 800 lbs. for 50 ft. drilling depths. Gives accurate samples of materials drilled. Every part can be handled by one or two men. Send for descriptive circular giving complete specifications. It will help if you advise us regarding drilling depths and general nature of work.



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Works: YONKERS, N. Y.

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Guaranteed Within
2 Per Cent

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Practically
No Pressure Loss

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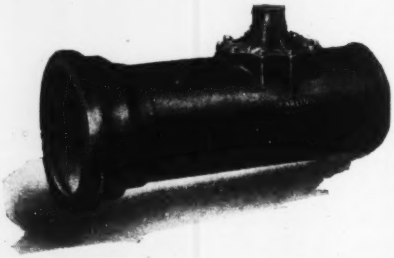
Indicators and Recorders may be installed at any distance desired from the meter. Auto-metered chemical feed controls, too, may be added as required.



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Elections and Activities

The Indiana County Road Supervisors Association has elected Harold E. Mason, Danville, president; Frank Bricker, Mulberry, and George Keilholz, Lafayette, vice presidents; and Ernest Coffin, Richmond, secretary-treasurer.

B. H. Hardaway, Jr., president of Hardaway Contracting Co., Columbus, Ga., has been elected president of the Georgia Highway Contractors Association, Inc. He succeeds C. G. Coffee, Coffee Construction Co., Eastman, Ga. Other officers: D. S. Wainer, Wainer Construction Co., Valdosta, vice-president, succeeding E. M. Beckham, Perry; M. R. Woodall, Atlanta, secretary, to succeed C. L. Rhodes, Decatur; and R. T. Smith, Decatur, re-elected treasurer. Directors, H. H. Claussen, Augusta; W. W. Gibson, Donaldsonville; Hugh McMath, Columbus; C. G. Coffee, Eastman.

The Association of Land Surveyors of New Brunswick was organized recently at Fredericton, N. B. G. G. Murdoch, St. John, civil engineer, is president, H. R. Hanson, Fredericton, vice-president, and J. H. Ramsay, Fredericton, secretary-treasurer.

Indiana Traffic Engineers Association has elected Elmo E. Stuckey, traffic engineer for the Fort Wayne District of the Indiana Highway Commission, as president. H. L. Hartman, Indianapolis, was named secretary-treasurer.

James R. Edmunds, Jr., Baltimore, Md., has been re-elected chairman of the Construction Industry Advisory Council, which was formed in 1945, and is made up of 107 national professional and trade associations with a major interest in construction.

S. R. Ross, civil engineer of Windsor, Ont., has been elected president of the Ontario Educational Association—the first time in 89 years, that the post has been held by a man from the technical side of education.

Chet Eyer, city engineer of Laurel, was elected chairman of the Montana Sewage Works association succeeding F. F. Palmer, city engineer of Forsyth. Others elected were Kurt Wiel, Miles City engineer, vice-chairman; Rodney Preator of Helena and Sam Ward of Dillon, trustees; Kenneth L. Chrysler,

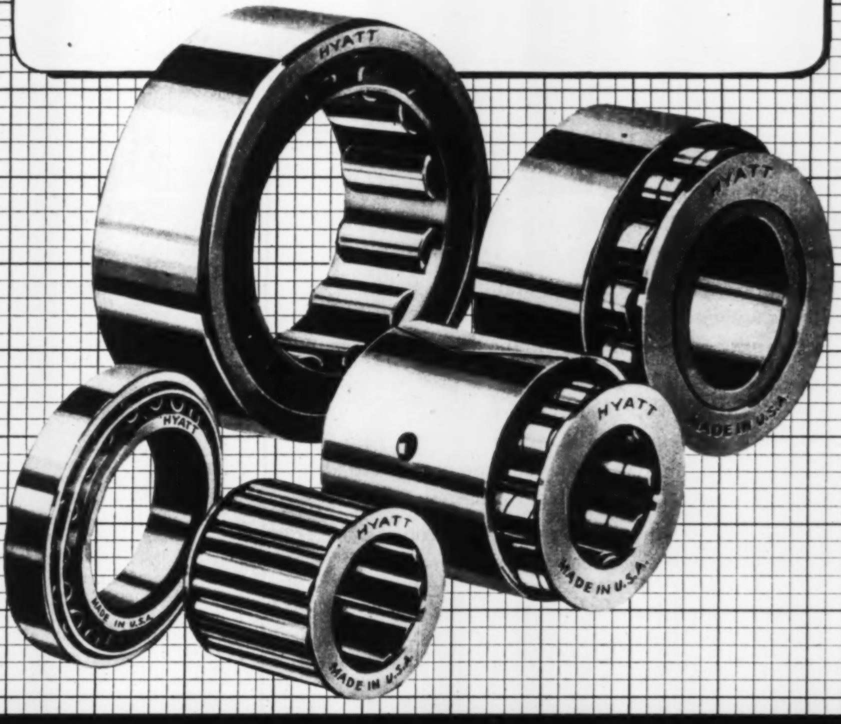
Inside Information

When you buy a machine or a piece of equipment, you want information on what's inside—particularly what grade of bearings you are getting.

When the specifications read "Hyatt Bearings" you know the roller bearings are O.K. in every way.

Leading manufacturers of machines and equipment in various fields—industrial—steel—petroleum—agriculture—textile—construction—transportation—materials handling and other fields, have designed Hyatt Roller Bearings into their equipment to assure smoother operation—longer life and reduced maintenance.

For more than fifty years Hyatt has produced top quality roller bearings to keep things rolling inside, smoother and longer. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.



HYATT ROLLER BEARINGS

LARGEST RUBBER HOSE

Engineered by Raybestos-Manhattan

A prominent southern chemical plant needed an unusually large, flexible, corrosive resisting line to discharge slurry through a narrow underground tunnel. It could be installed only by bolting together and drawing the entire line through – a tremendous strain on hose and flanges. The operation represented a large investment, a vital part of the process. They could not afford to take chances on anything but properly designed and engineered hose.

They gave the problem to Raybestos-Manhattan hose engineers. The result was the design and manufacture of what is believed to be the biggest rubber hose ever made in the long lengths required.

Pictured here are twelve 25′ lengths of 18″ I. D. Condor Flexible Rubber Pipe being checked by Raybestos-Manhattan engineers before shipment. One length of this huge hose weighs over half a ton . . . 1,425 lbs. Manhattan has made hose of larger diameters but, considering length, this is the biggest hose in its history.

If you have hose requirements, you can't go wrong by going to the men who are proved engineers of hose . . .

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Billings city engineer, reelected director, and H. B. Foote of the state board of health, reelected secretary-treasurer.

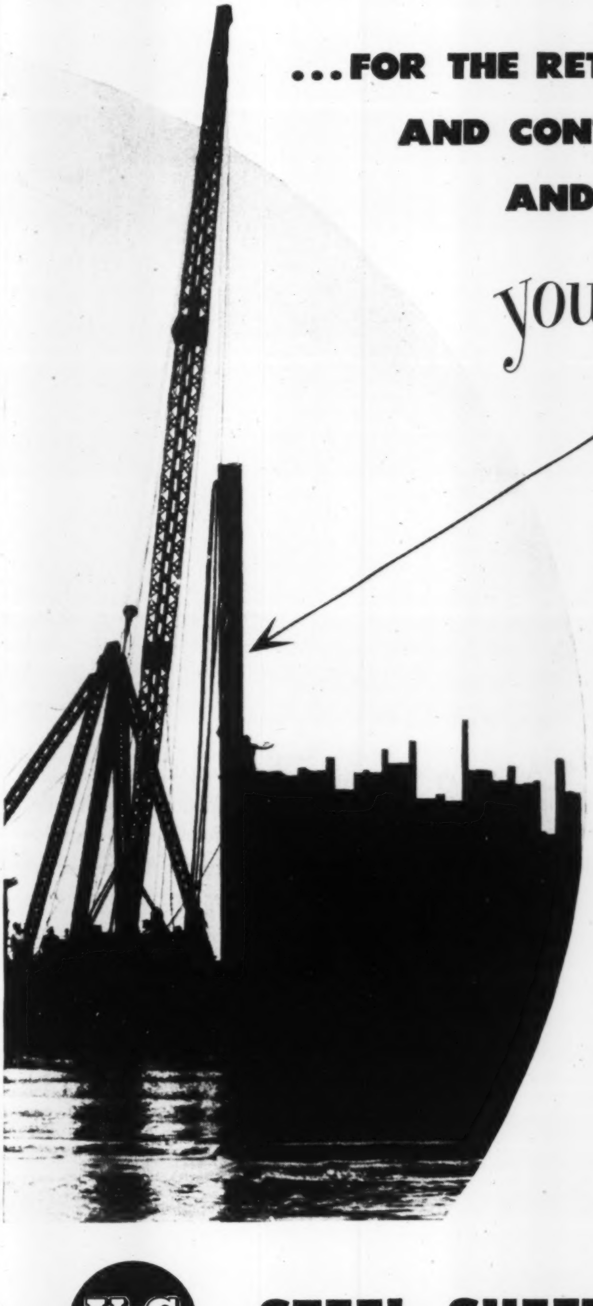
John W. Kurtz, of Omaha, is president of the Nebraska Engineering Society, succeeding H. C. Schlenter of Lincoln. Earl T. Luff, Lincoln, was elected vice president and J. S. Blackman, also of Lincoln, was reelected secretary.

M. F. Dixon, filtration plant superintendent for the Billings city water department, has been elected chairman of the Montana section of the American Water Works Association, succeeding John B. Hazen, water works superintendent at Butte. Other officers: M. E. Henderson, Bozeman city manager, vice-chairman; Harry McCann, distribution superintendent for the Montana Power Co. at Missoula, and Arthur T. Johnson, Kalispell water superintendent, trustees for one year, and John Hall, Fort Shaw consulting engineer, national director. C. W. Brinck of Helena, assistant director of the division of sanitary engineering for the state board of health, was reappointed secretary-treasurer.

Col. Gale Haynes of the Citadel, Charleston, S. C., was elected chairman of the Southeastern section of the American Society of Engineering Education succeeding Joshua E. Hannum of the Alabama Polytechnic Institute. Other officers: Dean Earl B. Norris, of Virginia Polytechnic Institute, vice-chairman; and Dean Robert L. Sumwalt of the University of South Carolina, re-elected secretary-treasurer.

The officers of the Southern Pine Association are: H. M. Seaman, Houston, Tex., president; E. O. Lightsey, Miley, S. C., first vice-president; J. R. Bemis, Prescott, Ark., second vice-president; W. T. Neal, Brewton, Ala., treasurer; and H. C. Berckes, New Orleans, La., secretary-manager

Better coordination and understanding between contractors and the state highway departments of the Carolinas appear certain as a result of a move by the Carolinas Branch of Associated General Contractors of America. Each state has appointed a highway committee to be the central clearing house for suggestions of the contractors and matters will be discussed at a joint meeting with the highway departments and the public works commissions. The North Carolina committee includes Ralph W. Parks, chairman, J. W. Thompson and J. Ray Wilson. Those on the South Carolina committee are J. R. McMeekin, chairman, Edwin B. Boyle and Harry W. Sims.



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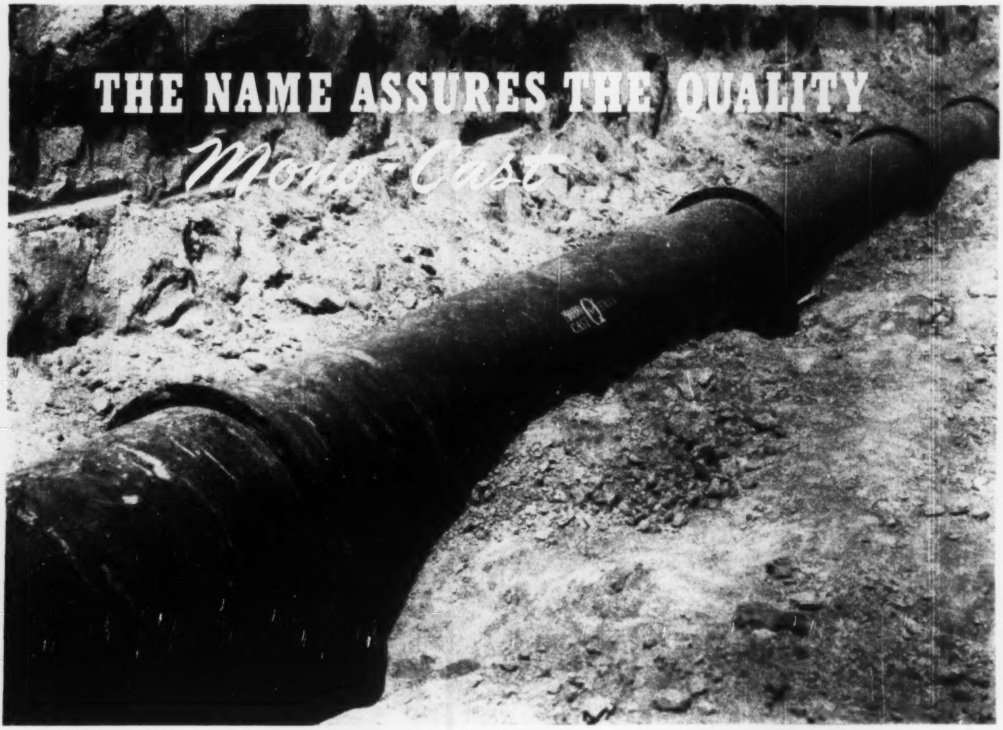

"Mono-Cast" is the trade name for Acipco pipe made by the centrifugal process. Manufactured under rigid specifications in diameters 3" through 48", it is corrosion resistant, will stand the impact of heavy loads and gives complete job satisfaction. It can be supplied with joints for conveying water, gas, oil, sewage and other liquids. These joints and a full line of standard accessory fittings make it easy to install under varying service and laying conditions.

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OBITUARY

Edward B. Stephenson, 67, of Washington, D. C., who worked in the Office of the Chief of Engineers after World War I and was a captain in the Engineer Reserve, USA, and latterly was chief of the mechanics division of the Naval Research Laboratory, died May 6 in San Francisco, Calif. A Washington, D. C., resident since 1917, Stephenson served on various Civil Service and Navy Department boards throughout his career. In 1946 he was made vice-chairman of a board of civil service examiners for scientific and technical personnel.

William S. Bergland, 64, engineer in the design division of the engineering department of the E. I. du Pont de Nemours and Co., died May 7 at Hockessin, Del. He had been with DuPont for 25 years.

Guy B. Smith died at Little Rock, Ark., May 9. He had served as Jefferson County engineer, engineer for the Farm Security Administration project, engineer for the War Relocation Authority at Jerome, and was a former Little Rock city engineer

George Lee Cary, 62, construction engineer and civilian Navy Department architect, died May 6 in Washington, D. C. He had been employed by the Navy Department for 37 years and had also worked at the Newport News Shipbuilding and Drydock Co. for several years.

Ward J. Dobbs, 43, engineer of the Watertown district of the New York State Department of Public Works, died May 6. Former engineer of the Watertown office, Mr. Dobbs was assistant to A. T. Van Horne, senior civil engineer in charge of work in Clinton County.

James L. King, 65, engineer with the N. Y. Fire Insurance Rating Organization, died in New York City May 10. He was an R.P.I. graduate of 1909 and was with the Army Corps of Engineers until 1916, working on harbor improvements. From that date until 1935 he was chief inspector of the N. Y. Board of Fire Underwriters.

Phillip S. Smith, 71, retired chief Alaskan geologist of the U. S. Geological Survey, died at St. Albans, Vt., May 10. A graduate of Harvard and formerly a member of its faculty, he entered the government service in 1906 and continued with the survey

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The Wachs National Pipe Saw is actually an air powered milling cutter that travels around the pipe on two silent type chains which act as a flexible ring gear, assuring positive feed and compensating for pipe bulges. This fast, accurate, labor saving saw makes the complete milled cut in one revolution at a travel rate of 2" per minute.

Write today for descriptive folder and engineering data on this new labor saving saw.

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for 40 years. He surveyed uncharted wastes in Alaska and in 1933-4 was engineer for the Federal Emergency Administration of Public Works in Alaska.

James W. S. Moss, 62, civilian engineer for the Navy Department, who 8 years ago served as an Army engineer in the Pentagon, died April 29 in Washington, D. C. He was graduated from the Stevens Institute of Technology and worked for the Edison Co. and then for the Safety Car & Lighting Co. in New Haven, Conn. He had switched from the Army to the Navy about a year ago.

William G. Starkweather, 79, founder of the Milwaukee Engineering Co., died at Newtonville, Mass., April 23. Graduated from the school of engineering at Cornell University in 1892, he worked several years for the American Steel Barge Co., Superior, Wis. Later he was employed by several manufacturing concerns in Milwaukee. In 1907 he founded the Starkweather Engineering Co. at Newtonville.

Curtis W. Abbott, Sr., 58, project engineer for the Federal Public Housing Authority in the seven southern states during the war, died at St. Petersburg, Fla., April 30. In 1924 he was an engineer on the construction of the Gandy Bridge at St. Petersburg.

Chas. E. Barnhill, 84, retired Akron, Ohio, construction engineer, died May 3.

Julius Sigman, 41, consulting engineer, partner in the firm of Sigman & Farkas, consulting engineers, New York City, died on April 25. A graduate of Cooper Union Institute of Technology, and had connected with Carson Construction Corp., the N. Y. Board of Transportation and the Board of Water Supply as field engineer, also as division engineer on construction of the Moscow subway, and section chief for F. H. Harris, Inc.

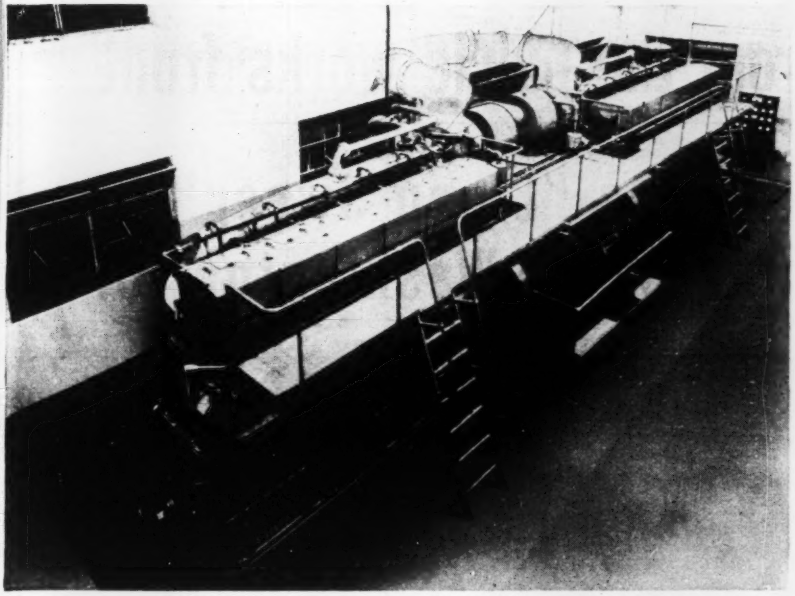
Charles A. Morse, retired chief engineer of the Rock Island Lines, died in Chicago, April 12.

Edward F. Simon, 71, engineer and architect, of Philadelphia, died May 9, at Brant Beach, N. J. He was a former director of the Federal Housing Administration for the Eastern District of Pennsylvania. He designed many notable structures including the Philadelphia Municipal Stadium, schools, and office and commercial buildings. He was a graduate of Drexel Institute of Technology, 1900.

NEWS

FROM THE
PUBLIC WORKS
FRONT

1



Worthington 16 X 20 SEHPG Twin 6 gas Diesel engine in municipal power plant at Lafayette, La.

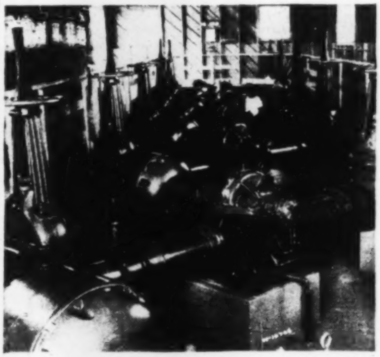
Fueling a Diesel with Gas Saves $5000 a Month

Because natural gas is readily available at Lafayette, Louisiana, the municipal power plant there uses it to fuel its Worthington gas Diesel engine. R. P. Hebert, the chief engineer, says: "Our actual cost of generating power with our Worthington gas Diesel is 2 mils per KW hour. Fuel oil costs 9 mils per KW hour, so we figure that we are actually saving about $5,000 a month by running our Diesel with gas."

But that is not the only saving with Worthington. Mr. Hebert reports: "Next to the low fuel cost of the Worthington gas Diesel, the most remarkable thing about the Worthington engine is its low lube oil consumption. Worthington estimates 4,000 BHP per hour for each gallon of lube oil consumed. Actually, we are getting about 10,000 BHP per gallon."

Maintenance cost is also low. "Maintenance cost on the Worthington Diesel has been low and operation steady. We have been operating the engine at a steady clip. In July, for example, she has operated for 714 out of 744 possible hours."

5 Wartimers Pump 29,160,000,000 Gallons Without Repairs or Shutdowns



Six Worthington pumps and motors in the Lower Otay Pumping Plant, San Diego, Calif.

To increase the water draft on the Otay-San Diego Main Pipe Line, the city of San Diego found it necessary in 1945 to install a booster pumping plant and thus increase the flow from 18 mgd to 27 mgd.

Six Worthington 10" Type LA pumps, driven by 150 hp motors, each unit rated at 5.4 MGD, were placed in operation on July 11, 1945. Five of the pumps are in operation at any one time. The plant has pumped about 27 mgd for a period of 3 years, or a total of 29,160,000,000 gallons, practically without interruption, and without any repairs or material shutdowns.

Mr. Fred D. Pyle, Hydraulic Engineer of this plant, writes, "The pumps and motors have performed in a most satisfactory manner, and are a credit to your company."

WORTHINGTON PUMP AND MACHINERY CORPORATION, HARRISON, N. J.

NEWS from the public works front

Virtually a "Clean Sweep" for Worthington in Washington, D. C.

Worthington centrifugal pumps at New Jersey Avenue main sewage pumping station, Washington, D. C.

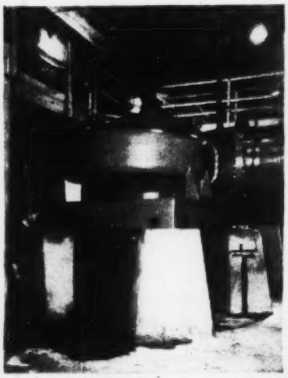
In the District of Columbia practically all of the water flows from source to disposal under the impulse of Worthington.

Drinking water furnished by the Washington Aqueduct, water supply system to the city, is taken from the Potomac River just above Great Falls. It is treated and pumped in part by the Dalecarlia Pumping Station, at the city's western boundary, directly to the District of Columbia distribution mains or to other pumping stations.

Originally there were nine Worthington filtered water pumps installed at Dalecarlia Pumping Station. One of these on being replaced by a larger unit was reinstalled as an emergency booster in the Anacostia area during the war.

The four Sanitary and six Storm Water Pumping Units at the New Jersey Avenue Pumping Station are Worthington-Electric Machinery. Some years ago, when the old steam-driven vertical centrifugals of another make were to be replaced, the contract was given to Suburban Engineering Company of New York whose low bid was based on furnishing Worthington-Electric Machinery units.

From New Jersey Avenue, sewage is pumped to the District's Sewage Treatment Plant at Blue Plains, D. C., where the four main pumps and motors are Worthington-Electric Machinery. From Blue Plains the effluent is returned to the Potomac—thus completing the cycle over which Worthington is encountered every step of the way.



One of four Worthington centrifugal pumps at Blue Plains Sewage Treatment Plant, Washington, D. C.

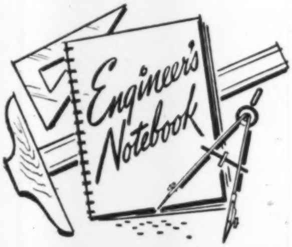
The District's pumping station at Bryant Street is scheduled to be completely rehabilitated and in connection with this modernization, Worthington has been awarded the contract for ten Worthington-Electric Machinery pumping units.

The Dalecarlia Pumping Station also supplies all the public water used by Arlington County, Virginia, where it is pumped into the distribution mains by three Worthington pumps.

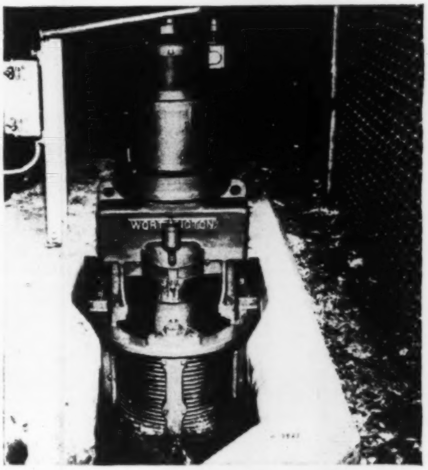
Worthington also has tens of thousands of water meters in the District of Columbia measuring the water pumped by Worthington pumps.

The total capacity of Worthington pumps in service and under contract for the District of Columbia water, sanitary, storm water and sewage treatment systems is 1,424,000,000 gallons per day.

Worthington Pump and Machinery Corporation
Harrison, N. J.



The Comminutor

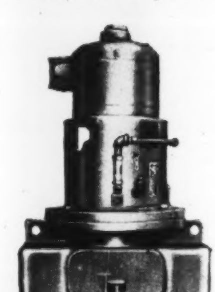


Worthington Comminutor (downstream view) installed in Essex Fells Sewage Treatment Plant, New Jersey.

The modern trend toward complete mechanization of sewage treatment plants is marked by the development of the comminutor, the device which screens out large solids in raw sewage and reduces them to a selected working size that will pass through a fine screen without later clogging mechanical equipment.

Comminutors of the type manufactured by Worthington are so designed that they will operate completely automatically, thereby eliminating the undesirable task of screening and disposal. Unsightly solids and offensive odors, usually connected with sewage treatment, can be made annoyances of the past.

Comminutors are generally used as a preliminary to treatment processes. Comminution is best performed by setting the sewage machine in a channel preferably after a grit chamber and preceding a primary settling tank. The comminutor may also be located so as to discharge into a wet well and, if necessary, the motor can be mounted above a possible flood elevation and intermediate shafting employed.



Worthington Comminutor, upstream view.

The Worthington comminutor is installed in existing or new straight sewage channels in single or multiple units, requiring no special channel design. Since the raw sewage is permitted to flow straight through the screen, installation problems have been simplified and cost minimized.

It consists of a compact, vertical unit comprising a screen, a mechanism for comminuting the screenings, and an electric motor. Only two racks of cutters are employed to simplify occasional sharpening or replacement.

The vertical, semi-circular, stainless steel screen retains all the coarse matter too large to pass through its horizontal 5/16 inch wide slots. An oscillating arm fitted with a rack of stainless steel cutters collects the screenings momentarily accumulated on the screen's inner surface as it moves back and forth through an angle somewhat less than 180 degrees.

Centrally located at the screen is a vertical, stainless steel stationary cutter. Since the teeth on the oscillating cutter pass through the teeth on the stationary cutter as the arm oscillates back and forth, comminution is performed when the solids are engaged between the two. A gradual cutting and shredding action is assured for the oscillating cutter is at an angle relative to the stationary cutter.

The small, vertical electric motor, usually directly mounted on the comminutor, drives the oscillating arm through a Scotch Yoke mechanism, which converts rotary motion into oscillating motion. The speed of the motor is reduced by means of a planetary gear, an integral part of the motor.

The effluent from the comminutor contains cut and shredded solids that have been screened, hence are of a workable size that settles rapidly, less likely to cause large amounts of scum, and do not clog mechanical equipment. Comminution is performed rapidly, continuously, and automatically; consequently the need for screening disposal has been eliminated and sedimentation and sludge digestion improve.

CONSTRUCTION REPORTS

Proposed Work—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.
ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

WATER SUPPLY

Calif., Novato—Northern Main Water Dist., c/o Clyde C. Kennedy, engr., 604 Mission St., San Francisco, voted $1,500,000 bonds, 77 ft. high water retention dam. **$950,000.** CD 4/8.

●**Calif., San Jose**—Santa Clara Valley Water Conservation Dist., 60 N. 2 St., San Jose, **$3,000,000** bond election June 14, Coyote Dam 2, storage dam. G. Walter Hunt, 60 N. 2 St., engr.

La., Rayne—Town, c/o mayor, **$100,000** bond election June 7, water and light plant imprvs.

Mass., Raynham — Town, Bd. Selectmen, Town Hall, 15 mi. pipelines, wells, standpipe. **$200,000.** Whitman & Howard, 89 Broad St., Boston, engrs. CD 1/25/46—ENR 2/7/46.

O., Wooster—City, booster pump. station, softening plant addns. Approx. **$400,000.** Jones, Henry & Schoonmaker, Security Bldg., Toledo, consult. engrs.

Tex., Colorado City—City voted **$670,000** bonds WW imprvs., expansion, incl. filter plant, pump, station and lines. CD 4/26.

Tex., Gatesville—City, WW, **$180,000.** Paul Gregory, Gatesville, consult. engr.

Tex., Kleberg—Dallas County Control Dist. 6, Olin Glenn, Kleberg, deep water supply well, 37 mi. various sized, pipe for mains and twps. for communities of Rylie, Kleberg-Lawson, **$200,000.**

Tex., Odessa—City voted bonds WW extens., imprvs. **$175,000.** J. E. Ward, 545 Nacol Bldg., Wichita Falls, consult. engr.

Tex., Smithville—City voted **$100,000** bonds WW sys. exten. Garrett Eng. Co., 5008 Almeda Rd., Houston, consult. engr. CD 4/11.

●**Tex., Texas City**—Galveston County Water Co., Texas City, secondary or principal reservoir, 700 acres, **$1,500,000;** 30 in. watermain extens. to Republic Oil and Richardson Refinery, $115,000; 16 in. waterline extens. from Pan-American Plant to Tin Processing Plant, **$80,000.** Gus Thornton, c/o owner, engr.

Utah, Newton—Town, c/o Harold Bartlett, clk., 150,000 gal. concrete reservoir and supply line. Harding & Benton, 414 Utah Savings & Trust Bldg., Salt Lake City, engrs.

Wash., Enumclaw—Water Dist. 84, Enumclaw, rural water sys. from springs. **$297,000.** H. T. Harstad & Assoc., Smith Tower, Seattle, Zone 4, consult. engrs.

Wyo., Cody—City, voted bonds water sys. imprvs., incl. addnl. watermains, rebuild and lower some existing mains, complete construction of city water filtration sys. **$130,000.** CD 4/5—ENR 4/28.

SEWERS, WASTE DISPOSAL

Calif., Los Angeles—Bd. Supervs., Los Angeles Co., 501 Hall of Records, sanitary sewers in 133 St., etc. Hawthorne **$161,100;** sanitary sewers in Willard Ave., etc., Temple City, **$114,700.** C. E. Arnold, 205 S. Broadway, co engr.

Calif., Pomona—City, 205 W. 4 St., municipal incinerator, **$380,000.** Black & Veatch, 4706 Broadway, Kansas City, Mo., consult. engrs. Fred D. Froehde, 205 S. 4 St., Pomona, engr.

Calif., Redwood City—City, City Hall, voted **$150,000** bonds sewage disposal proj. Glenn M. Jain, city engr. CD 3/18.

Ill., Springfield—State of Illinois, Springfield, sanitary and storm sewers, Illinois State Fair Grounds, **$106,000.** C. Herrick Hammond, Springfield, state archt.

Ind., Indianapolis — Bd. P. Wks., 104 City Hall, Div: 1 W. 14 St. and W. 12 St. Main Sewer from White River to Luett Ave.; Div. 2, Ritter Ave. and E. 10 St. Main Sewer from Pleasant Run to Bolton Ave.; Div. 3, **(1)** Boyn Ave. Main Sewer from Bean Creek to Carson Ave. **(2)** E. 32 St. and Washington Blvd. Main Storm Relief Sewer from Fall Creek to 36 St. Bids will be received June 23 from professional engineers for preparation of detailed plans, specifications, estimates, etc. N. G. Johnson, city engr. CD 7/22/43.

La., Denham Springs—Livingston Parish, Denham Springs, voted **$560,000** bonds, drainage sys.

●**O., Cleveland Heights**—City, W. H. Kimpel, Service Dir. City Hall, 2953 Mayfield Rd., storm sewer and general correction of sanitation sys. **$1,500,000.** F. A. Pease Eng. Co., 603 Frederick Bldg., 2063 E. 4 St., Cleveland, consult. engr. CD 11/22—ENR 12/9/48.

O., Washington Court House—City, high rate filtering plant to be added to present sewage disposal plant. Paul A. Uhlmann & Assoc., 1441 N. High St., Columbus, consult. engrs. CD 10/9/46—ENR 10/31/46.

Pa., Middleburg—Middleburg Boro, Middleburg, sewerage sys. **$200,000.** Gannett, Fleming, Corddry, Carpenter, 600 N. 2 St., Harrisburg, consult. engrs.

Pa., South Connellsville—South Connellsville Boro, W. R. Lingenfield, secy., sewage treatment facilities, sewers. **$200,000.** Richard S. Harman, State Chamber of Commerce Bldg., Harrisburg, consult engr. CD 2/19/45—ENR 3/22/45.

Tex., Odessa—City voted bonds sanitary sys. exten., imprvs. **$200,000.** J. E. Ward, 545 Nacol Bldg., Wichita Falls, consult. engr.

Tex., Smithville—City, G. S. Shade, mayor, voted bonds sanitary sewerage sys. and treatment plant. **$200,000.** Garrett Eng. Co., 5008 Almeda Rd., Houston, consult. engr. CD 4/18.

●**Wyo., Cheyenne**—City, voted bonds, sewage disposal plant. **$1,110,000.** Black & Veatch, 4706 Broadway, Kansas City, Mo., engrs. and archts. CD 3/29.

Ont., Toronto—North York Twp., 5270 Yonge St., incinerator. **$800,000.**

BRIDGES

Fla., Daytona Beach—Volusia Co., c/o Reynolds, Smith & Hills, engrs., P. O. Box 1048, Jacksonville, Seabreeze Bridge. **$500,000.** CD 3/18—ENR 4/14.

Georgia—State Hy. Dpt., Atlanta,

Chatham Co.—bridge over Wilmington River, Thunderbolt, **$500,000.**

●**New York**—State Dpt. P. Wks., Albany,

Erie Co.—high level bridge to carry Fuhrmann Blvd., Arterial Rt. over Buffalo River and Buffalo Ship Canal on line with Main St., Buffalo. **$6,000,000.** Edward P. Lupfer Corp., S. Ellicott Sq., Buffalo, engr.

●**O., Cleveland**—Wheeling & Lake Erie Ry. Co., W. L. Peoples, engr. Maintenance and Ways and Structures, Brewster, steel, concrete lift Bridge 2.2 mi. above the mouth of Cuyahoga River, known as Bridge 222. **$2,000,000.**

●**Pennsylvania**—State Hy. Dpt., Harrisburg, revised plans,

Cumberland and Dauphin Counties — construct highway bridges over Susquehanna River between Worleysburg and Harrisburg. **$5,500,000.** E. L. Schmidt, c/o owner, ch. engr. CD 11/10/47—ENR 11/27/47.

South Carolina—State Hy. Dpt., Columba,

Charleston Co.—highway bridge over Stono River, **$400,000.**

Washington—State Hy. Dpt., O. R. Dinsmore, dir., Olympia,

Jefferson Co.—reconstruct approaches to Bogachiel River Bridge on Secondary State Hy. 9-B, **$45,000.**

replace 4 bridges with fills and culverts on Secondary Hy. 9-F, near Sequim, **$10,000.**

Stevens Co.—approaches to Columbia River bridge at Northport, **$140,000.**

bridge on Springdale-Loon Lake Hy. **$90,000;**

detour bridges at Northport, **$40,000.**

●**Nova Scotia**—Dpt. Transport, Ottawa, Ont., and Nova Scotia Provincial Govt., Halifax, bridge over ½ mi. Strait of Canso, Approx. **$13,500,000.** Dr. P. L. Pratley, 1117 St. Catherine St. W., Montreal, Que., engr. CD 9/29/44—ENR 10/19/44.

N. S., New Glasgow—Canadian National Railways, B. Wheelwright, ch. engr., 360 McGill St., Montreal, subway, **$150,000.**

●**Ontario**—Province of Ontario, Toronto,

Burlington — overhead bridge, cloverleaf over Burlington Canal. **$2,000,000.** Dpt. Hys., Toronto, engrs.

STREETS AND ROADS

Ariz., Phoenix — City, wid'n. 9 blocks arterial hy. **$175,000.** R. Gail Baker, City Hall, city engr.

Calif., San Diego — City, Civic Center Bldg., imprv. Myrtle St., etc. **$114,279.** Alden K. Fogg, Civic Center, engr. CD 12/6/44—ENR 12/28/44.

●**Colorado**—State Hy. Dpt., Denver,

Adams and Boulder Counties—surveys constructing Denver-Boulder Toll Rd., **$5,300,000.** Mark U. Watrous, state hy. engr. Howard, Needles, Tammen & Bergendoff, 921 Walnut St., Kansas City, Mo., engrs.

Colo., Denver—City and Denver Co., T. P. Campbell, mgr. Imprvts. & Parks, City and County Bldg., Denver, paving district on 17 St. from Broadway to Wynkoop, removing tramway tracks and present pavement and repaving street from curb to curb with 8 in. concrete, **$188,839.** Terry Owens, City and County Bldg., city engr.

Colo., Denver—City and Denver Co., City and County Bldg., street imprvs., in Distr. 164. Approx. **$380,190.** Terry Owens, city engr.

Connecticut—State, G. Albert Hill, hy. comr., State Office Bldg., Hartford,

Fairfield—rein.-con. new approach to Merritt Parkway imprv. Redding Rd. south from Dunham Rd. to Governor's lane and constr. road to connect Bronson Rd. and Hulls Farm Rd. **$135,000.** R. E. Jorgensen, State Office Bldg., Hartford, engr.

Conn., Ansonia—City, T. F. Pratt, supt. P. Wks., City Hall, layout and constr. street parallel to Main St. **$150,000.** Vincent B. Clarke, 356 Main St., Ansonia, engr.

Ill., Chicago—City, City Hall, c. conc. paving 6,700 ft. W. Belmont Ave. between N. Damen and N. Sheffield Sts., **$455,000;** c. conc. paving 6,700 ft. W. Belmont Ave. between N. Kimball and N. Western Aves., **$78,000.** CD 4/25/45—ENR 5/3/45.

Ill., Chicago—City, City Hall, b. conc. paving 5,300 ft. W. 51 St. from S. Halsted to State Sts. **$307,000;** b. conc. paving 5,300 ft. W. Devon St. from N. Kedzie to Western Ave., **$337,000.** CD 4/26/45—ENR 5/17/45.

Mich., Saginaw—City, City Hall, 20 street conc. paving jobs for 1949 and 1950. **$267,245.**

Minn., Bovey—Village, J. J. Specht, clk., bit. surf. streets, curbs, gutter, **$100,000.** E. G. Briggs, 2360 University Ave., St. Paul, engr.

Neb., Curtis—City, street paving. **$100,000.** E. Y. Grupe, Scottsbluff, consult. engr. CD 4/18.

O., Cleveland—City, City Hall, Lakeside and East Sixth St., approx. 13,000 ft. b. conc. T-50 resurfacing lower East Boulevard through Gardan and Rockefeller Parks. **$100,000.** J. C. Wenrick, 518 City Hall, city engr.

O., Cleveland—City, Leo J. Weil, dir. Purchases, City Hall, Lakeside and 6 Sts., wid'n. and resurface W. 117 St., boundary line between Cleveland and Lakewood, from Edgewater Dr. to 1,900 ft. south beyond Detroit Ave. **$200,000.** John C. Wennick, city engr.

O., Cleveland—Comrs. Cuyahoga Co., Frank Husak, clk., Courthouse, Lakeside St. and Ontario Ave., grading, B-50 bit. conc. paving 6,000 ft. Chagrin River Rd. from Berkshire Rd. to Fairmount Blvd., 20 ft. wide, at Gates Mills. **$378,000.** Albert S. Porter, Standard Bldg., co. engr. CD 11/12/43—ENR 11/18/43.

●**Rhode Island**—State Hy. Dpt., F. A. Adams, Purchasing Dpt., Providence,

Providence Co.—repaving, repairing Cranston St. **$238,000.**

rebuilding, paving Orms and Valley Sts. **$457,000.**

Westminster St. from Olneyville Sq. to Winter St. **$170,000.**

reconstruct Silver Spring St. and Smithfield Ave. **$179,000.**

paving Waterman St., completion from Thayer St., **$175,000.**

laying new pavement Fountain and Franklin Sts. **$155,000,** all foregoing in Providence.

Tennessee—State Hy. Dpt., Nashville,

Clay Co.—5.7 mi. from Willow Grove via Fairview to Overton Co. line.

Cheatham Co.—7.4 mi. from Route 49 to Davidson Co. line, 12.7 mi. from Route 112 to Route 12; 8 mi. from Route 49 at Greenbriar to Dickson County line (Harpeth River); 4 mi. from Route 12 to Doddsville.

Cumberland Co.—6.3 mi. from Route 1 to U. S. Route 70 south at Pleasant Hill; 2.5 mi. from 2 mi. south of Lantana Rd. to State Park; 3 mi. from Route 1 1½ mi. northwest of Westel to old Route 1 at Daysville; 3.5 mi. from Route 68 to Route 1, 1½ mi. northwest of Crab Orchard.

Dickson Co.—6 mi. from Route 47 to Oakley's Store.

Fentress Co.—9 mi. from Route 28, 5½ mi. north of Jamestown via Fairview to Pickett Co. line at Dry Creek; 2.8 mi. from Route 52, 1 mi. northeast of Indian Creek to Manson; 2.5 mi. from Route 52, 4½ mi. east of Allardt to Shirley; 5 mi. from Route 52, 1 mi. east of Jamestown to Mill Creek Rd.

Hardin Co.—6 mi. from Route 22, Shiloh Park to Route 57.

Haywood Co.—14 mi. from Brownsville via Buffalo store to Union.

Henry Co.—11 mi. from Elkhorn via Nobles to Buchanan; 7 mi. from Vandyke via Mansfield to Carroll Co. line; 10 mi. from Route 9015 (Fowlers School) to Benton Co. line; 8 mi. from Route 96 via Jones Mill to Puryear; 6 mi. from Route 96 via Ridgeway store to FAS 8022 (Birds Creek Church); 4.5 mi. from FAS 8022 2 mi. east of Puryear via Conyersville to Kentucky line; 3.5 mi. from Route 54 to Crossland; 14 mi. from Route 76 at Henry via Midway and New Boston to Route 96 at Osage; 4 mi. from Route 9147 (New Boston) to FAS 8092 1 mi. south of Cottage Grove; 2.5 mi. from Route 75 1 mi. east of Paris to county farm; 5.5 mi. from FAS 8022 (Buchanan) to Route 76; 2 mi. from Weakley Co. line to Route 8092 1 mi. north of Cottage Grove.

Jackson Co.—11.2 mi. from Route 53; 3.5 mi. from North Springs junction of Route 56 to Clay Co.; 2 mi. from Putnam Co. line to Route 53.

Marshall Co.—5 mi. from Route 50, Belfast to Route 40, Farmington; 5 mi. from southeast of Lewisburg to Route 4280.

Moore Co.—1.5 mi. from Route 50 to Lois; 7 mi. from Lois via Arbor Church to Elk River (Franklin Co. line); 5 mi. described as "Federal Secondary 4287"; 7 mi. from Lincoln Co. line near Booneville via Charity to Route 10.

Perry Co.—2.6 mi. from Route 13 via Depriest Bend to intersection Tom's and Roance Creek Rd.; 0.8 mi. from Route 13 to Buffalo River bridge; 2.9 mi. from Route 13 to top of ridge; 0.5 mi. from Cane Creek to Lost Creek Rd.; 0.7 mi. from Route 13 to Wayne Co. line; 1.9 mi. from Route 100 2 mi. up Coon Creek; 1.8 mi. from Route 13 to Marsh Creek Hill; 7 mi. from Route 13 to Sinking Creek 1 mi. from Cedar Creek Rd. to TVA road (Graham's store); 2 mi. from Route 100 at Brush Creek 2 mi. toward Route 13; 1 mi. from Russell Creek to Lost Creek.

(Continued on page 115)

CHICAGO

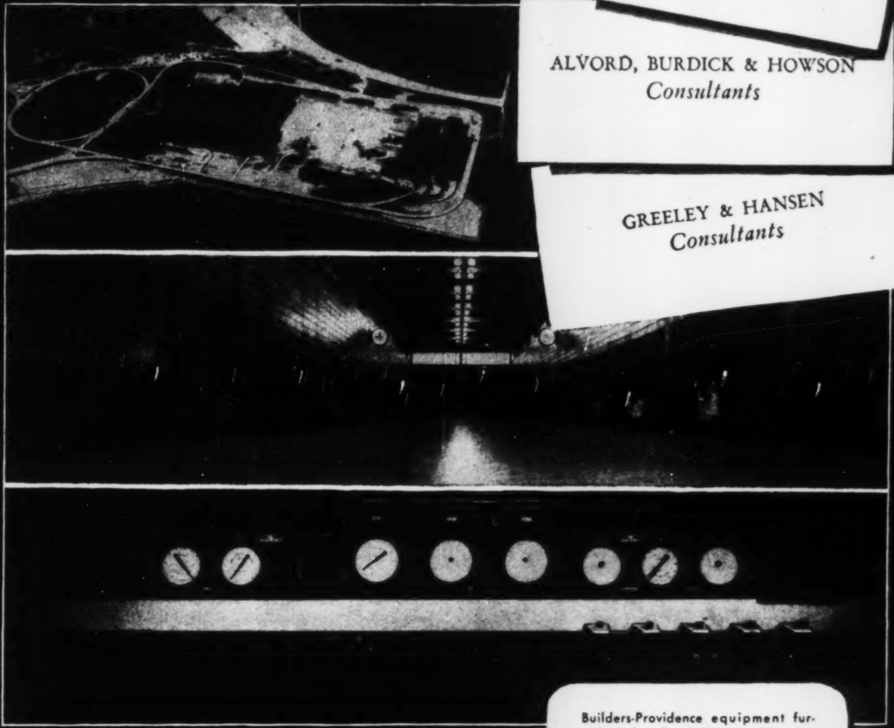
South District Filtration Plant

(Completed in 1947)

DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
W. W. DeBERARD, City Engineer

ALVORD, BURDICK & HOWSON
Consultants

GREELEY & HANSEN
Consultants



Chicago's new South District Filtration Plant, the largest in the world, supplies filtered water to over 1,300,000 people in Chicago and its suburbs. Builders-Providence filter equipment was installed in this giant plant by Pitt Construction Company. For Bulletins describing Builders waterworks equipment, address Builders-Providence, Inc., (Division of Builders Iron Foundry), Providence 1, R. I.

Builders-Providence equipment furnished for South District Filtration Plant:

- **80 20" Venturi Rate of Flow Controllers**
- **76 3-dial Filter Gauges (Sand Expansion, Loss of Head, Rate of Flow)**
- **160 Pneumatic Transmitters**
- **4 Master Filter Gauges**
- **4 20-unit Pneumatic Summators**
- **2 2-unit Pneumatic Summators**
- **10 30" Double Dial Illuminated Gauges**
- **4 30" Back Wash Venturi Controllers with Pneumatic Transmitters and Recorders**
- **4 16" Surface Wash Venturi Tubes with Pneumatic Transmitters and Recorders**

Illustration shows Builders Master Gauge and Operating Table.

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Instruments

Announcing the NEW

LIMA TYPE 1002

Convertible SHOVEL, CRANE and DRAGLINE

Features

- Precision Air Control
- Anti-Friction Bearings
- Independent Chain Crowd on Shovel Boom
- Truck base—one-piece double annealed steel casting
- Rotating base—one-piece reinforced annealed steel casting
- Dependable Diesel power unit
- Tubular Dipper Handle
- Extra long, wide crawlers
- Large diameter cable drums
- Extra large, point sheaves
- Modern full vision streamlined cab
- Independent Propel (Optional)
- —and many others.

This new addition to the LIMA line now makes available a convertible unit with 2½-yard shovel and 61-ton* crane capacity. Like all LIMA machines, the 1002 is engineered and built for maximum output at low operating costs and with minimum maintenance. It is equally effective as a shovel, crane or dragline, and readily converted from one to the other. Tested "on-the-job" for many months under the most gruelling conditions, it has established new records for speed and stamina. We proudly present it as the outstanding machine in its field.

Other LIMA excavators include Shovels—¾ to 6 yards, Cranes 13 to 110 tons and Draglines variable. Write for descriptive bulletins.

*With 60-foot boom at 12 foot radius.

It will pay you to consult your nearest Lima Sales Office or representative before you buy your next shovel, crane or dragline. Offices in principal U.S. cities.

Lima Shovel and Crane Division

LIMA, OHIO

LIMA HAMILTON CORPORATION

OTHER DIVISIONS: *Lima Locomotive Works Division; Niles Tool Works Co.; Hooven, Owens, Rentschler Co.*

(Continued from page 112)

Putnam Co.—6 mi. from U. S. Route 70 at Lafayette via Sadler's School to Jackson Co. line; 1.2 mi. from Route 24 ½ mi. west of Cookeville to Route 24, 1½ mi. west of Cookeville.

Robertson Co.—4 mi. from Route 49 to Owen's Chapel.

Trousdale Co.—8 mi. from Route 10 to Golden Hollow Rd.; 0.8 mi. from Smith Co. line to Cato Rd.; 2.8 mi. from Route 6133 to Willard Rd.; 2 mi. from Templow to Route 10; 0.7 mi. from Hartsville to cemetery; 3 mi. from Hartsville to Hubert Wynn's; 0.5 mi. Hartsville's Lafayette Rd.

Van Buren Co.—5.8 mi. from point 4½ mi. west of Route 11 to Warren Co. line; 14 mi. from 3 mi. south of Route 30 to Sequatchie Co. line; 7 mi. from Route 30, 5 mi. northeast of Spencer to Route 11 at Cummingsville.

Warren Co.—7 mi. from Route 56 at Fairview to Route 30; 10 mi. from Charles Creek to Faulkner Springs via Green's Cross Roads at DeKalb Co. line.

Tenn., Greenville — Greene Co., c/o County Engineer, blacktopping various roads, **$215,000.**

Tenn., Loudon—Loudon Co., John Mitzell road comr., Loudon, blacktopping 80 mi. roads. **$250,000.**

Tex., Galveston—Galveston Co., Courthouse, grading, drainage, drainage structures, flexible base, asph. topping various road in Bolivar Peninsula, **$140,000;** grading, drainage structures, flexible base, asph. topping, Alvin-Dickinson Rd., **$125,000.** Freese, Nichols & Turner, 2111 Natl. Standard Bldg., Houston, consult. engrs. CD 4/22/48—ENR 5/13/48.

Tex., Groveton — Trinity Co., Courthouse, farm-to-market road, east out of near Lovelady, to Hy. near Groveton. **$109,000.**

Tex., LaPorte — Olds, Nelson & Grostman, 6500Harrisburg St., Houston, 20 ft. c. conc., street paving, 400 acre development, Laporte and Red Bluff Rds. **$100,000.**

Tex., Lubbock—City, W. H. Rodgers, mayor, asph. paving streets. **$325,000.** Koch & Fowler, Gr. Natl. Bank Bldg., Dallas, consult. engrs.

●Tex., Port Neches—Jefferson Co., c/o Comrs. Court, Port Neches, road construction and imprvs., Precinct 1, **$500,000;** Precinct 2, **$500,000;** Precinct 3, **$500,000;** Precinct 4, **$500,000.** Charles L. Davidson, Beaumont, co. engr. CD 6/28/48—ENR 7/8/48.

Tex., Taylor—Williamson Co., c/o Judge, Courthouse, Georgetown, defeated bonds constructing approx. 30 mi. roads to connect with 2 main highways, northern half of Precinct 4, **$400,000;** approx. 18 mi. southern half of Precinct 4, **$340,000.** CD 3/24—ENR 4/14.

Washington—State Hy. Dpt., Olympia.

Jefferson Co.—relocation Secondary State Hy. 9-A at Whiskey Creek near Joyce, **$53,500.**

relocation of 4 mi. Deep Creek east, **$14,000.**

riprap near Clallam Bay junction. **$6,000.**

oiling secondary State Hy. 9 E. Port Ludlow to South Point, **$17,500.**

grading, surfacing, oiling 3.5 mi. Primary State Hy. 9, Contractor's Gulch to Discovery Bay, **$310,000.**

b. conc. paving 7.8 mi. from junction with Secondary H. 9-B to Bogachiel River. **$155,000.**

oiling 9.2 mi. between Hoh and Bogachiel Rivers, **$92,000.**

surf. 2.8 mi. Rainbow Trail to Quilcene River. **$56,000.**

oiling 2.5 mi. Lilliwaup to Eagle Creek, **$9,000.**

oiling Clallam, Co. line to Contractor's Gulch, **$38,000.**

oiling 1.16 mi. East Beach to Lake Crescent, **$7,500.**

oiling 2.5 mi. Lake Crescent to Barnes Cove, **$7,500.**

oiling 1.8 mi. McDougal Creek revision, **$11,000.**

grading, surf. oiling 0.4 mi. Sappho, **$20,000.**

Stevens Co.—grading, surf. oiling Loon Lake to Springdale, **$249,000.**

oiling 1.5 mi. Springdale north, **$9,000.**

oiling 1.5 mi. Valley north, **$9,000.**

oiling junction of Primary State Hy. 22 at Colville, **$10,000.**

oiling from junction of Primary State Hy. 3 to Marcus, **$6,000.**

grading, surf. 0.5 mi. Northport-Patterson, **$5,000.**

oiling 12 mi. Colville-Narcisse, **$26,000.**

surfacing, oiling 5 mi. at China Bend, **$50,000.**

re-ballasting 1 mi. Narcisse to Little Pend Oreille River, **$8,000.**

oiling 1 mi. to Lancey's Mill pond, **$6,000.** O. R. Dinsmore, acting State Hy. Dir.

Manitoba—Province of Manitoba, Winnipeg.

Vinden—grav. 28.6 mi. Vindent to Saskatchewan boundary. **$518,850** voted Dpt. P. Wks., Winnipeg, engr.

EARTHWORK, WATERWAYS

✦Illinois—U. S. Eng., 826 U. S. Court House and Custom House, St. Louis 1, Mo., levees, East St. Louis, and vicinity, along east bank Mississippi River opposite approx. Miles 176.5 and 178.3, above mouth of Ohio River. Proj. Item 11-A(2). East Side Levee and Sanitary Dist., St. Clair Co.

✦Missouri—U. S. Eng., 826 U. S. Court House and Custom House, St. Louis, Zone 1, levee imprvs., Elsberry Drainage Dist., vicinity Elsberry, opposite Mississippi River, Mile 250 and 257 to 260 above mouth Ohio River, Pike and Lincoln Counties.

N. J., Atlantic City—N. J. Dpt. Conservation & Economic Development, State House Annex, Trenton, 6 jetties, along Beach Front, **$200,000.** G. R. Swinton, city engr.

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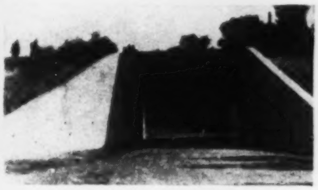

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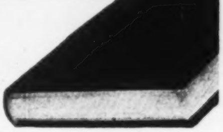

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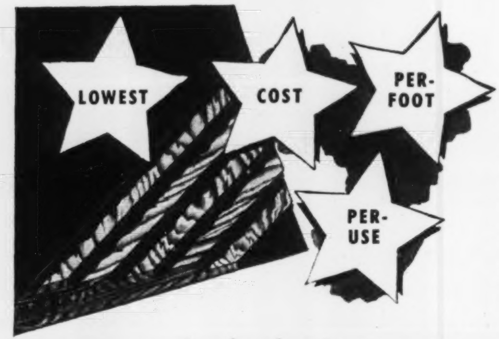

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Texas—Medina Lake Irrigation Co., Medina, rehabilitating Medina Lake and its water distr. sys., planning 32,000 acres by gravity irrigation and 2,000 by pump. Medina area, Bexar, Medina and Atascosa Counties. **$450,000.**

Tex., Houston—Phillips Chemical Co., c/o City Natl. Bank Bldg., dredging dock area on the ship channel sufficient to care for 15 ships at one time. **$100,000.**

●Philippines, Manila—Philippine Govt., Dpt. P. Wks., Manila, 14 irrigation projects to expand rice production. **$5,000,000.**

AIRPORTS AND AIRBASES

Ark., Little Rock—RUNWAY—City, 7,000 ft. runway at Adams Municipal Airport, **$200,000.** CD 10/18—ENR 11/4.

Calif., Monterey — TERMINAL — Monterey Airport Dist., Monterey, plans by Robert R. Jones, Ocean and Mission Sts., Carmel, Edwin Verner, 401 1 St., San Francisco, and Neill & Bestos, Dolores and 7 Sts., Carmel, airport terminal, incl. 3 airline space allotments, parking aprons, office space at Monterey airport. **$180,000.**

Colo., Colorado Springs—AIRPORT IMPRVS., etc.—City, airport imprvs. and administration bldg. at Peterson Field. **$195,000.**

●Conn., New Haven — AIRPORT — Municipal Airport Comn., plans by Harrison E. Baldwin, 464 Wehalley Ave., airport development of facilities runways, hangars, administration bldgs., etc. **$2,500,000.** CD 3/26/48—ENR 4/15/48.

●La., Shreveport—AIRPORT—City, City Hall, plans by Samuel G. Wiener, Commercial National Bank Bldg., Class 5 municipal airport, **$4,000,000.** E. M. Freeman & Assoc., City Bank Bldg., consult. engrs. CD 5/27/47—ENR 6/12/47.

Mass., Chatham — AIRPORT IMPRVS. — Town, Bd. Selectmen, Town Hall, airport imprvs., incl. 2,700 ft. landing strip, 300 ft. wide, paved runway 2,500x100 ft., turf shoulders and parking areas. **$180,000.**

Neb., Grand Island—AIRPORT—City, airport. **$100,000.**

N. C., Greensboro—AIRPORT—Greensboro-High Point Airport, Greensboro, runway extens. at airport, and resurfaced old paved areas. Southern Mapping & Eng. Co., 216 Commerce Bldg., consult. engr. CD 1/9/45—ENR 2/8/45.

♦Pa., Johnsville—TEST STATION BLDGS.—Pub. Wks. Office, Phila. Naval Base, Phila., Air Test Station bldgs. NOY 18410 **$217,000.**

Tex., Beaumont — TERMINAL — Jefferson Co., c/o Airport Comn., Courthouse, plans by Heartfield & Woodside, 224 Orleans St., and D. E. Steinman, Kyle Bldg., airlines passenger terminal, **$732,000.** C. L. Davidson, co. engr. CD 4/28.

Tex., Brownsville—AIRPORT—City, H. L. Stokeley, mayor, Rio Grande Valley International Airport. **$100,000.**

●Tex., Houston—ADMINISTRATION BLDG.—City, City Hall, 900 Brazos St., administration bldg. for municipal airport. **$1,000,000.** Wyatt C. Hedrick, 5201 Fannin St., consult. engr. CD 7/31/46—ENR 8/22/46.

Tex., Houston—AIRPORT—National Guard, Col. Bill Nottingham, ch. of staff, 63rd Fighter Wing, Houston, municipal airport facilities, incl. ramps, lighting, warehouse, general imprvs. **$500,000.**

Tex., Marble Falls—AIRPORT—City, R. O. Smith, mayor, airport. **$100,000.** Alamo City Engineers, 3005 Transit Tower, San Antonio, consult. engrs.

FOREIGN

Scotland, Ayr—Scottish Agricultural Industries, Ltd., Ayr, plans fertilizer plant. **$2,500,000.**

PUBLIC BUILDINGS

Ala., Atmore—State of Alabama, c/o Sherlock, Smith & Adams, archts., 301 Washington Ave., Montgomery, rebuilding prison. **$800,000.**

Calif., Berkeley—Berkeley Bd. Educ., Rose and Walnut Sts., plans by Miller & Warnecke, Financial Center Bldg., Oakland, Burbank Junior High School addn. **$660,000.** CD 11/17/48—ENR 12/9/48.

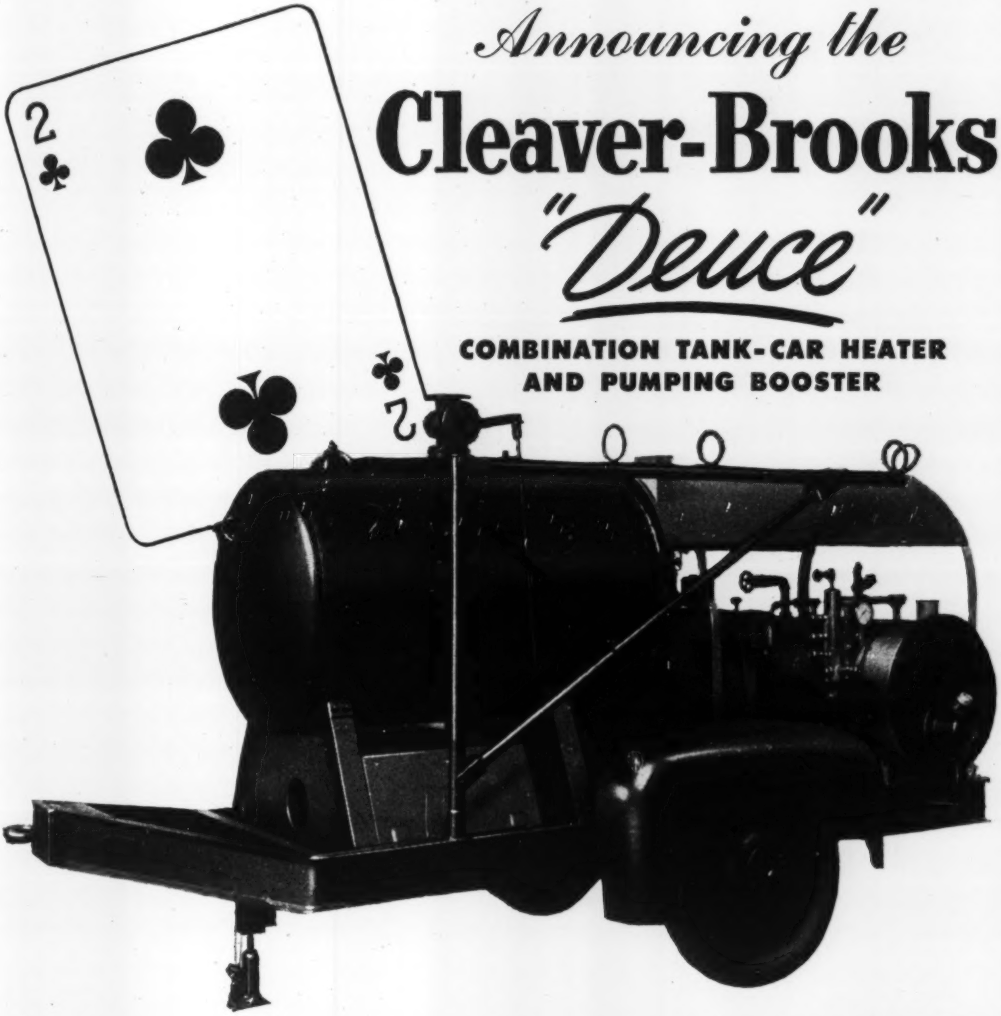
●Calif., Berkeley—Bd. Regents University of California, Berkeley, plans by Michael Goodman, 2161 Shattuck Ave., partial 4 story, rein.-con., steel virus and bio-chemistry laboratory. **$1,000,000.** Hall & Pregnoff, 251 Kearny St., San Francisco, consult. engrs.

Calif., Corning—Corning Hospital Dist. Plans by Albert W. Kahl, 18 2 St., San Mateo, 25 bed hospital. **$360,000.** CD 4/14.

●Calif., Lemoore—Lemoore Union High School Dist., Lemoore, plans by Franklin & Simpson, 752 Fulton St., Fresno, Lemoore High School. **$1,000,000.**

●Calif., Los Angeles—Bd. Regents, University of California, 451 N. Hilgard Ave., plans by Marsh, Smith & Powell, 208 W. 8 St., Unit II, life sciences bldg., **$2,380,000;** plans by Austin Field & Fry, 608 Chamber of Commerce Bldg., home economics bldg., **$1,000,000;** plans by Ralph D. Cornell, landscape archt., 3723 Wilshire Blvd., grading, landscaping southern part of campus, **$150,000.** CD 8/24/44—ENR 9/7/44.

(Continued on page 119)



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SPECIFICATIONS

	Skid	Rubber-Tired Trailer
Over-all length, in.	159	185
Over-all width, in.	66	81
Over-all height, in.	71	90
Shipping weight, lbs......	6350	7080

RATINGS

Steam Boiler — 10 H.P — 125 Lbs. W.P.
Operating burner at full capacity and pumping materials:

Approx. 300 G.P.M. temperature rise 25-35° F.
Approx. 180 G.P.M. temperature rise 45-55° F.
Approx. 100 G.P.M. temperature rise 85-95° F.
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FABRICATED STEEL CONSTRUCTION

(Continued from page 116)

Calif., Rio Vista—Rio Vista Elementary School Dist., Rio Vista, voted **$400,000** bonds manual training shop, cafeteria, and gymnasium.

Colo., Pueblo — Pueblo Junior College, Pueblo, plans by Walter De Mordaunt, engr. and archt., 758 Thatcher Bldg., vocational technical bldg., **$400,000.**

Conn., Hamden—Town, P. M. Fleming, chn. Bd. Educ., plans by Henry S. Kelly, 2828 York St., New Haven, 2 story, bsmnt., brick State Street School addn.; brick Church Street School addn.; brick, steel Helen Street School addn., **$250,000** each. CD 1/29/47—ENR 2/20/47.

Conn., Madison—Town Bd. Selectmen, Town Hall, plans by Westcott & Mapes, 109 Church St., New Haven, 2 story, bsmnt., brick, steel school, classrooms, auditorium, library, etc. **$600,000.** CD 10/28/48—ENR 11/11/48.

Conn., Meriden—City, J. D. Shaw, chn. School Bldg., Comn., plans by Willard Wilkins, 957 Asylum Ave., Hartford, brick, steel, concrete school, **$600,000.** CD 2/25—ENR 3/17.

●**Fla., Orlando**—Orange Co., Orlando, plans by Al Hatton, Church and Main Sts. school bldgs. **$6,000,000.**

●✝**Ill., Chicago**—Atomic Energy Comn., 1701 E. 57 St., plans by Schmidt, Gardner & Erikson, 104 S. Michigan Ave., 6 story, brick Argonne Cancer Research Hospital, operated by University of Chicago, **$3,500,000.**

Ia., Council Bluffs—Council Bluffs Chamber of Commerce, Council Bluffs, 15 apartments. **$400,000.**

Kan., Hutchinson—City, City Hall, voted **$485,000** bonds, convention hall, Mann & Co., Hutchinson, archts. CD 3/3/44—ENR 3/23/44.

●**Kan., Lawrence**.— Bd. Educ., Lawrence, **$1,820,000** bond election May 26, Senior High School, elementary school addns. CD 12/1—ENR 1/6.

●**La., Crowley**—Acadia Parish Police Jury, Crowley, plans by Theo L. Perrier, Carondelet Bldg., New Orleans, court house, **$1,000,000.** CD 10/21—ENR 11/11.

La., Ferriday—Concordia Parish School Bd., Vidalia, plans by Smith & Pagett, Ouachita National Bank Bldg., Monroe, consolidated school. **$425,000.**

La., Jennings—P. School Bd., Jefferson Parish, Jennings, plans by Barron & Heinberg, Alexandria, high school. **$575,000.**

●**Md., Towson**—Baltimore Co. Bd. Educ., Towson, Loch Raven School addn., **$400,000;** Maiden Choice School addn., Wilkens Ave. and Maiden Choice Ave., **$500,000;** Catonsville High School, Old Rolling Rd. and Valley Rd., **$2,210,000;** North Point Junior Senior High School, near Gray Manor, west of North Point Hy., **$1,690,000;** 2 story Mars Estate School, Back River Neck Rd. and Old Eastern Ave., **$775,000;** Back River School addn., **$250,000;** Stoneleigh School addn., **$300,000;** Colgate School, **$280,000.**

●**Mich., Ann Arbor**—Bd. Educ., Ann Arbor, voted $5,800,000 bonds, West Side School, Southeast Junior High School, West Side High School replacement, 3 swimming pools, etc., **$7,075,000.** CD 2/21/47—ENR 3/6/47.

✝**N. M., Los Alamos**—U. S. Atomic Energy Comn., Los Alamos, brick, concrete school, poured concrete fdn., in North Community area. **$525,000.**

●**N. Y., Albany**—Dpt. P. Wks., Albany, new bldg. housing offices of State Dpt. Health on 7 acre site on Holland Ave. **$1,000,000.**

N. C., Windsor—Bertie Co., Windsor, plans by George Watts Carr, Durham, hospital. **$600,000.**

O., Painesville—Bd. Educ., Painesville, plans by Harry A. Fulton, 6014 Euclid Ave., Cleveland, nursery school addn. **$260,000.**

●**O., Parma**—Parma City School Dist., 5401 W. 54 St., Cleveland, plans by Harry Fulton, 6014 Euclid Ave., Cleveland, school Pearl Rd., **$1,000,000;** high school, **$1,000,000.** CD 2/4/48—ENR 2/19/48.

O., Toledo—Ottawa Hills Bd. Educ., Ottawa Hills School Dist., Toledo, plans by Peterson, Hoffman & Barber, 1051 Spitzer Bldg., Ottawa Hills School addn. and Ottawa Hills High School addn. Approx. **$250,000** each.

O., Willoughby—Willoughby Bd. Educ., Willoughby, plans by Harry A. Fulton, 6014 Euclid Ave., Cleveland, Junior High School. **$656,000.**

Okla., Bartlesville—Comrs. Washington Co., Bartlesville, plans by Thomas F. Holifeld, 1806 Hillcrest Dr., 5 story, bsmnt., 58-bed County Memorial Hospital addn.; remodeling hospital, central heating plant, steel frame, masonry constr. **$800,000.** CD 9/27—ENR 9/30.

●**Okla., Oklahoma City**—Bd. Educ., 400 N. Walnut St., voted bonds, school buildings. **$3,100,000.** CD 3/11—ENR 3/31.

●✝**Pa., Phila.**—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash., 25, D. C., East Germantown Post Office bldg. **$350,000;** U. S. Mint bldg., **$13,600,000;** Continental Post Office Bldg. **$515,000;** Frankford Post Office Bldg., **$580,000;** Chestnut Hill Post Office Bldg., **$250,000;** Germantown Post Office Bldg., **$565,000.** CD 11/21/45—ENR 1/3/46.

S. C., Chester—City, plans by Lafaye, Lafaye & Fair, 1226 Sumter St., Columbus, hospital. **$600,000.**

Tenn., Lexington—Henderson Co., courthouse, **$500,000.**

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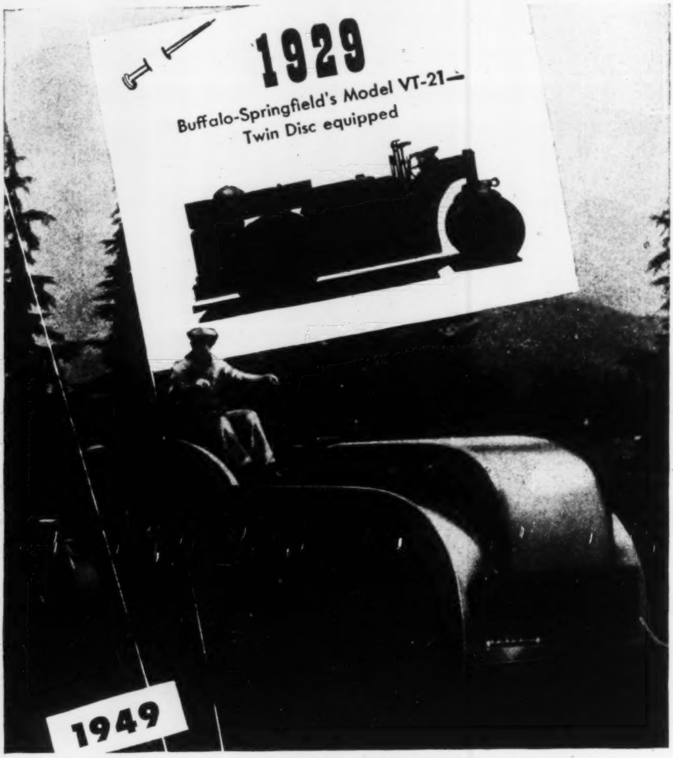

Buffalo-Springfield's Model KX-25—Twin Disc equipped

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In February, 1929, The Buffalo-Springfield Roller Company introduced Model VT-21, a seven-ton tandem road roller. *This roller was equipped with Twin Disc Clutches.*

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Tenn., Memphis — Shelby Co., Memphis, plans by I. G. Norton, Falls Bldg., Douglass School. **$100,000.**

Tex., Alice—Alice Independent School Dist., Alice, voted bonds grade school, **$250,000;** elementary school, **$275,000.** Addis E. Noonan, American Hospital & Life Bldg., **San Antonio,** archt.

Tex., Beaumont—Beaumont Independent School Dist., Beaumont, plans by Stone & Pitts, 1872 Calder St., high school gymnasium. **$400,000.** Goleman & Rolfe, San Jacinto Bldg., School Bd. co-ordinating archts.

Tex., Beaumont—City, Otho Plummer, mayor, coliseum and rehabilitation of fairground bldgs. **$500,000.** R. C. Black, city engr.

●**Tex., Dallas**—City, City Hall, Main and Harwood Sts., and Dallas Co., Courthouse, $3,000,000 bond election May 21, city-county hospital. **$10,000,000.** Roscoe De Witt, Gulf States Bldg., archt. CD 12/13/45—ENR 2/28/46.

●**Tex., Houston**—City Housing Auth., George D. Neal, chn. Housing Comn., Sterling Bldg., plans by Wyatt C. Hedrick, engr. and archt., 5201 Fannin St., 5,000 low rent housing units. **$25,000,000.**

Tex., Rankin—Independent School Dist., c/o Hamilton Still, supt., plans by Wilson & Patterson, 209 Majestic Bldg., Fort Worth, 1 story, masonry, steel joists school, auditorium, cafeteria and library, 78x178 ft. gymnasium and band room, masonry, steel constr. **$400,000.**

Utah., Farmington—Davis County School Bd., Farmington, voted bonds, Senior High School at Bountiful, and elementary schools and Bountiful and Clearfield, etc. **$920,000.** CD 4/5

Utah, Salt Lake City—Salt Lake Bd. Educ., 440 East 1st South St., plans by Lowell E. Parrish, Beneficial Life Bldg., Junior High School, 17 South and 19 East Sts. **$850,000.** CD 12/15—ENR 1/7.

Va., Rocky Mount—Franklin Co. Memorial Hospital, c/o Eubank & Caldwell, archts., Boxley Bldg., Roanoke, hospital. Approx. **$250,000.**

+**Wash., Richland**—Atomic Energy Comn., Wash. 25, D. C., plans by Mallis, DeHart & Hopkins, Lyon Bldg., Seattle Zone 4, Junior High School. Approx. **$250,000.**

●**Wash., Tacoma**—City, City Hall, plans by S. E. Nelson, 210 North G St., library. **$1,000,000.** CD 11/14/46—ENR 11/28/46.

●**Wash., Tacoma**—Pierce Co., County Courthouse, plans by A. G. Lumm, Rust Bldg., tuberculosis sanatorium. **$1,000,000.** CD 11/14/46—ENR 11/28/46.

+**Wash., Vancouver**—National Park Service, Interior Bldg., 19 and C Sts. N.W., Wash. 25, D. C., reception center and museum at Fort Vancouver Monument. **$200,000.**

Wis., Chippewa Falls—Chippewa Co., Chippewa Falls, plans by Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., Green Bay, 2 story, bsmnt., 111x114 ft. limestone jail, concrete fdn. and floor. **$300,000.**

Wis., Milwaukee—City, warehouse. **$215,000.** J. P. Schwada, city engr.

●**Wyo., Casper**—School Dist., Casper. **$4,000,000** bond election May 25, school imprvs., new Junior High School and schools for grade division.

B. C., Cortenay—Trustees School Dist. 71, Courtenay, plans by Hubert Savage, 745 Yates St., Victoria, Senior High School. **$700,000.** CD 8/29—ENR 10/3/46.

●**B. C., Port Alberni**—School Comrs., Port Alberni, school. **$1,500,000.**

●**N. B. Grand Falls**—New Brunswick Electric Power Comn., Fredericton, steam driven electric plant, **$2,220,000.**

●**N. S., Halifax**—Province of Nova Scotia, Dpt. P. Health, Halifax, treatment bldg., **$1,000,000** voted; power house exten. at Victoria General Hospital, **$221,000** voted; landscaping at grounds, Victoria General Hospital, **$50,000** voted Dpt. Hys. & P. Wks., Halifax, engrs.

Ont., Ingersoll—Collegiate Institute Dist., R. W. Green, chn., collegiate, Ingersoll, North Oxford, East Missouri, West Zorra and West Oxford area, Approx. **$600,000.**

●**Ont., Pickering** — Canadian Commercial Corp., J. D. McCarthy, secy., 70 **Lyon St.,** Ottawa, 200 houses, for personnel of Canadian Artillery School, Approx. **$1,400,000.**

Ont., Toronto—Toronto Western Hospital 391 Bathhurst St., A. J. Swanson, supt., plans by Govan, Ferguson, Lindsay, Kaminker, Maw, Langley & Keenleyside, 515 Jarvis St., 70x170 ft., brick, steel wing to hospital. Approx. **$860,000.**

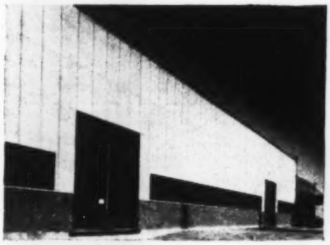
COMMERCIAL BUILDINGS

●**Ala., Mobile**—Mobile Infirmary, Inc., c/o Platt Roberts & Co., archts., Merchants Bank Bldg., 250-bed hospital. Over **$1,000,000.**

●**Calif., Belmont**—G. W. Williams, 10 California Dr., Burlingame, project cancelled 400 residences Foothill Tract, **$4,000,000.** CD 3/24—ENR 4/7.

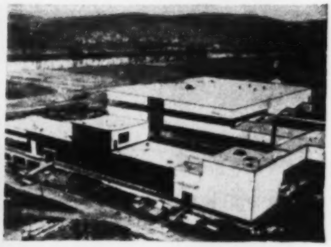
Calif., Burlingame—Roman Catholic Archbishop of San Francicso, 1100 Franklin St., San Francisco, plans by Martin J. Rist, 345 W. Portal Ave., San Francisco, St. Catherine's Church and rectory. **$300,000.**

(Continued on page 123)



Unique beauty of Cemesto in a curtain wall. Curtiss-Wright Corp., Louisville, Ky. Architect: Albert Kahn Associates, Inc., Detroit, Mich.

Modern residence of Berkeley, California. Architect: Richard J. Neutra.



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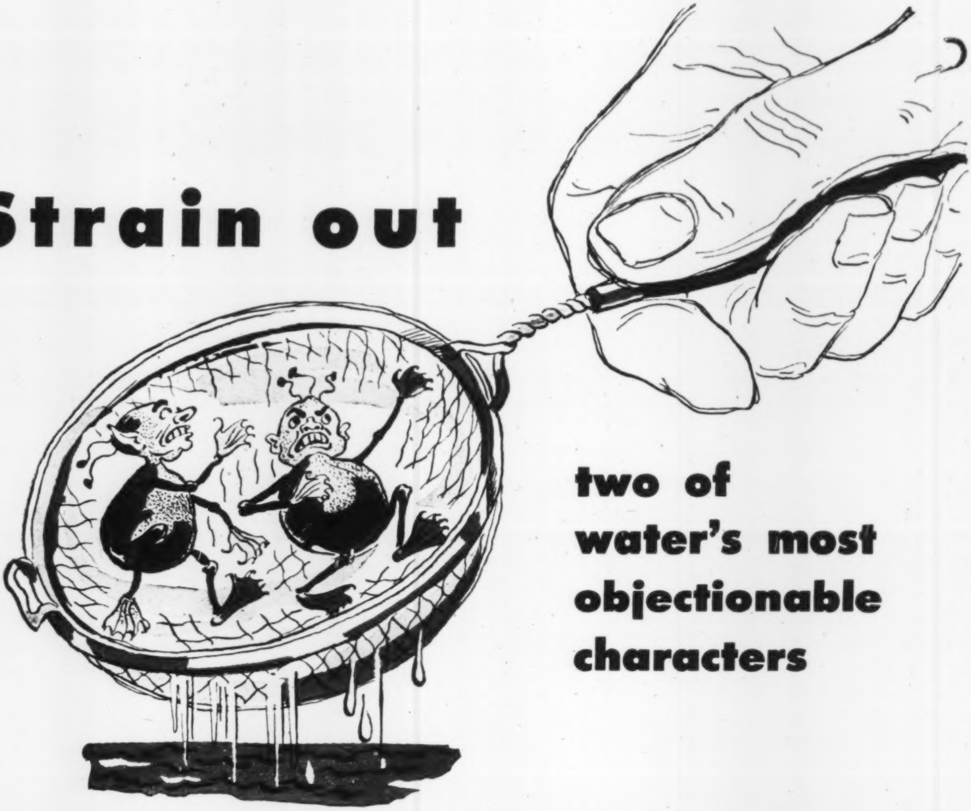
Cemesto on an arched deck. Monarch Rubber Co., Hartville, Ohio. Contractor: Dennis Steffy.

Caulking joints between Cemesto panels. Carolina Asbestos Co., Marshville, N. C. Contractor: Interstate Const. Co. Architect: A. G. Ulrey.

Asphalt roll roofing applied over Cemesto. Pittsfield Township School, Washtenaw, Mich. Architect: C. Nobel. Contractor: DeKenning Const.

Strain out



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(Continued from page 120)

Calif., Gilroy—Howson Bros. & William Hall, Gilroy, 89 residences in Glenview Tract. **$500,000.**

Calif., Huntington Park—J. C. Penney Co., c/o Harold S. Johnson, archt., 606 S. Hill St., 3 story, bsmnt., 100x150 ft. masonry store. **$375,000.**

Calif., Los Angeles—Roman Catholic Archbishop of Los Angeles, 714 W. Olympic Blvd., plans by Harold Gimeno, 14 Plaza Square, Orange, 34,000 sq. ft. rein.-con. parochial school, Our Lady of Lourdes Parish, at Rowan Ave. and 3 St. Approx. **$250,000.**

Calif., Los Angeles—Roman Catholic Archbishop of Los Angeles, 714 W. Olympia Blvd., plans by Barker & Ott, 4334 W. Pico Blvd., 1,000 rein.-con. seating church of St. Paul the Apostle. Approx. **$250,000.**

Colo., Denver—Cottrell Clothing Co., 621 16 St., plans by Burnham Hoyt, Colorado National Bank Bldg., 2 story, 75x125 ft. clothing bldg. **$250,000.**

●**Colo., Denver**—J. C. Penney Co., 21 S. Broadway, plans by Raymond Ervin, archt. and engr., Patterson Bldg., Denver, 6 story department store. **$1,000,000.**

Colo., Pueblo—Thomas J. Downen, Pueblo, housing, incl. log houses, 1150 sq. ft. floor space, two 2-rental unit duplex on Asbury Heights, between 24 and 26 Sts., and Pueblo Golf and Country Club. **$500,000.**

Colo., Wray — Wray Community Hospital Assn., J. C. Graham, pres., Wray, plans by Eugene G. Groves, 405 California St., Denver, 25-bed hospital. Over **$250,000.**

Conn., Milford—Devon Union Church, F. Campbell, pastor, plans by J. J. Hamblin, 1188 Main St., Bridgeport, 1 story, bsmnt., church, school, auditorium, Pequot Ave. and Ormond Sts. **$250,000.**

Conn., Simsbury—Joseph Faith, Unionville, brick, steel business bldg., incl. theater, stores and offices, Hopmeadow St. **$250,000.**

Conn., Willimantic—American Screw Co., W. Main St., 30 family units. **$250,000.**

Del., Claymont—The Childrens Home, 200 Todds Lane, Wilmington, plans by Walter Carlson, Pennsylvania R. R., childrens home **$250,000.**

Fla., St. Petersburg—First Avenue Methodist Church, plans by Archie Parish & Robert B. Crowe, 213 Hall Bldg., church and chapel, **$600,000.**

Fla., St. Petersburg—Hildon Apartments, c/o Archie G. Parish, archt., 213 Hall Bldg., apartment development. Approx. **$250,000.**

Fla., St. Petersburg—Webb's City, Inc., c/o J. E. Webb, 128 9 St. S., shopping center addn. **$500,000.**

Fla., Tampa—H. N. Edmonson, Dale Mabry Hy., plans by Leroy Sheftall, Clark Bldg., Jacksonville, large housing. **$300,000.**

Ga., Atlanta—Murphy Apartments, Inc., c/o Phillip N. Wilkinson, archt., 320 Wilkinson Dr. S. E., 66 apartment units. **$360,000.**

●**Ga., Atlanta**—Sanford Chiropractic Center, c/o A. Thomas Bradburn, archt., 60 5 St. N. E., Chiropractic hospital. **$1,000,000.**

Idaho, Arco—W. G. Coseman, Pasco, Wash., 2 story hotel. **$400,000.**

Ill., Chicago—Amalgamated Meat & Butcher Workman of North America, 201 N. Wells St., 2 story brick, steel office. **$500,000.**

Ill., Chicago—American Institute of Baking, 1135 W. Fullerton St., plans by Skidmore, Owings & Merrill, 100 W. Monroe St., 1 and 3 story, steel, brick office and school for baking. **$500,000.**

●**Ill., Chicago**—Robert Bartlett Bldg. Corp., 111 W. Washington St., 121 houses, near 59 and Edgewood Sts., Gilbert St., 59 Pl., 60 St., 61 Pl., 61 St., and 63 St., Lyons Twp. **$1,210,000.**

●**Ill., Chicago**—Howard K. Hurwith, 175 Insurance Exchange Bldg., plans by Chas. Wheeler Nicol & Assoc., 23 E. Jackson Blvd., 13 story, brick, steel, rein.-con. apartment, Sheridan Rd. and Ardmore Ave. **$2,000,000.**

Ill., Chicago—Henry H. Marks, 10 S. LaSalle St., plans by Carl J. Kastrup, c/o owner, four 5 story, brick, steel apartments, Catalpa and Rockwell Sts. **$550,000.**

Ill., Chicago—O'Connells, Inc., 422 E. Grand Ave., plans by Carl M. Teutsch, 1105 W. Lawrence Ave., 1 story, steel restaurant, Sheridan Rd. and Bryn Mawr, **$300,000.**

Ill., Chicago—Owner, c/o Charles W. Nicol, archt., 23 E. Jackson Blvd., steel, brick apartment, 5485 S. Everett Ave. **$600,000.**

Ia., Centerville—St. Joseph Hospital, Centerville, hospital addn. **$500,000.**

Kan., Hutchinson—St. Elizabeths Hospital, Hutchinson, plans by Mons. J. L. Gatton, Catholic Hospital Consultant, 1301 W. Monroe St., Springfield, Ill., hospital addn. **$400,000.**

●**Kan., Kansas City**—Leonard Childers, 1024 N. Washington Blvd., Kansas City, Kan., 68 ranch type dwellings, **$1,000,000.** Truman Schlup, 1401 Fairfax Trafficway, Kansas City, Kan., consult. engr.

Kan., Topeka—Most Pure Heart of Mary Parish, 19 and Stone Sts., plans by Griest & Ekdahl, Northeast Bldg., parochial school. **$250,000.**

Ky., Lebanon—Mary Immaculate Hospital, c/o Thomas J. Molan & Sons, archts., Kentucky Life Bldg., Louisville, hospital. **$400,000.**

●**Md., Baltimore**—Johns Hopkins University, Charles and 34 Sts., plans by Buckler, Fenhagen, Meyer & Ayers, St. Paul and 24 Sts., 3 or 4 story, brick, stone, concrete, steel

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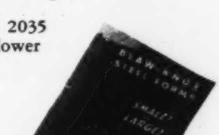

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Shriver Hall. **$1,200,000.** CD 5/7/48—ENR 5/27/48.

Md. Baltimore—Medical and Chirurgical Faculty of Maryland, 1211 Cathedral St., plans by Palmer, Fisher Williams & Nas, 1020 St. Paul St., 2 story, bsmnt. bldg. addn., 1213 Maryland Ave. **$500,000.**

Mass., Fall River—Roman Catholic Diocese of Fall River, Rev. J. E. Cassidy, 394 Highland Ave., plans by Maginnis & Walsh, 126 Newbury St., Boston, 3 story, bsmnt., brick, steel, concrete aged folks home addn., Highland Ave. **$275,000.**

●**Mich., Detroit**—University of Detroit, 4001 W. McNichols Rd., plans by Harley, Ellington & Day, 153 E. Elizabeth St., 3 story, bsmnt., L-shaped library. **$1,000,000.**

●**Minn., Minneapolis**—Minneapolis & St. Louis Ry. Co., C. S. Weatherill, ch. engr., Northwestern Bank Bldg., Minneapolis, plans by C. W. Smith, 1004 Marquette Ave., 2 story, bsmnt. office, Franklin Ave. between First and Stevens Aves. **$1,000,000.** CD 4/14—ENR 5/5.

Minn., Minneapolis—Owner, c/o Rev. L. P. Cowley, 2 Ave. S. and 8 St., plans by J. V. Vanderbilt, 617 National Bldg., 2 story chapel and student center, 17 and University Ave. S. E. **$250,000.**

Minn., St. Paul — Macalester College, C. J. Turck, pres. 1600 Grand Ave., plans by C. H. Johnston, 715 Empire Bank Bldg., 3 story student union bldg. **$500,000.**

Mo., Columbus — Commonwealth Theatres, Inc., 215 W. 18 St., Kansas City, plans by Robert O. Boller & Dietz Lusk, assoc. archts., 7332 Brooklyn Ave., Kansas City, Mo., brick, concrete, steel theatre, 1101 Broadway. **$250,000.**

Mo., Fulton—Westminster College, c/o Bd. Trustees, Fulton, plans by Wedemeyer & Hecker, Cotton Belt Bldg., 111 N. 4 St., St. Louis, Zone 2, brick, concrete, stone library. **$250,000-$300,000.** CD 7/30—ENR 8/19.

Mo., St. Louis—City Bus Terminal Co., c/o Stifel Realty Co., 24 N. 4 St., and lessee, World Fair Theater Corp., H. Paul, Stroud, pres., c/o World Theatre, 596 St. Charles St., Zone 1, plans by Schmidt & Krueger, 6376 Clayton Rd., Zone 10, 2 story, bsmnt., rein.-con., steel, stone bldg., containing, theatre, shops, bowling alleys, Broadway and Washington Ave. **$400,000.**

Mo., St. Louis—Engineers Club of St. Louis, c/o Bd. Directors, 4359 Lindell Blvd., Zone 8, brick, concrete, steel club, 4576 W. Pine Blvd. **$367,000.**

●**Mo., St. Louis**—Washington University, c/o Dean Robert A. Moore, School of Medicine and A. H. Compton, chancellor, Skinker and Lindell Blvds., Zone 5, combined hospital, outpatient dtp. office, laboratory; north addn. to Maternity Hospital; research laboratories; altering neurology and neurosurgery bldg.; Childrens Hospital addn., hospital and research laboratory; 4 story Rand-Johnson Bldg., top addn. of Barnes Hospital; 4 story Mallinckrodt Institute of Radiology top addn.; **$7,000,000.**

Mo., St. Louis—Washington University, c/o Chancellor, Arthur H. Compton, Lindell and Skinker Blvds., St. Louis, Zone 5, brick, concrete, steel rehabilitation center. **$500,000.**

Mont., Miles City—Sacred Heart Parish, Miles City, plans by J. G. Link & Co., Billings, school. **$260,000.**

Neb., Lincoln—Newman Club, University of Nebraska, 12 and R Sts., Catholic Youth Center, near here. **$250,000.**

Nev., Reno—Riverside Hotel, 17 S. Virginia St., plans by De Longchamps & O'Brien, 160 Chestnut St., and Frank Green, 1515 N. Chevy Chase St., Glendale, Calif., 4 story, bsmnt., rein.-con. Riverside Hotel addn. **$600,000.**

N. Y., Auburndale—Dana Development Corp., c/o Sullivan Jones Assoc., archts., 110 E. 42 St., New York, Zone 17, apartment, Rocky Hill Rd. between 201 and 202 Sts., **$180,000;** Rocky Hill Rd. between 202 and 203 Sts., **$220,000.**

●**N. Y., Bayside**—A. B. K. Apartments, Inc., c/o Stanley H. Klein, archt., 90-04 161 St., Jamaica, apartments at 210 St. southwest corner of 43 Ave., **$265,000;** 43 Ave. southwest corner of 210 St., **$395,000;** Corporal Kennedy St., northeast corner 43 Ave. **$246,000;** Corporal Kennedy St. southeast corner 43 Ave. **$340,000;** north side of 43 Ave. near 212 St., **$395,000;** southside 42 Ave. near 212 St., **$395,000;** 212 St., northwest corner of 43 Ave., **$265,000;** 212 St. southwest corner of 42 Ave., **$265,000;** 42 Ave. near Corporal Kennedy St., **$340,000.**

N. Y., Bayside—Whitestone Estates, Inc., c/o A. H. Salkowitz, archt. 37-60 82 St., Jackson Heights, 65 one-family houses, 23 Ave. and 205, 206, 207 Sts. and 26 Ave., **$390,000.**

N. Y., Brooklyn—B. L. Building Corp., 543 E. 21 St., Zone 26, plans by Julius Fishkind, 141 Broadway, New York, Zone 6, 6 story apartment, 1818-40 Ocean Ave. **$875,000.**

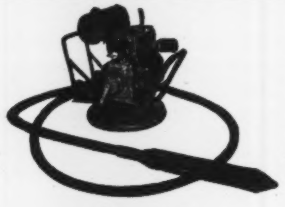
N. Y., Brooklyn—Charles M. Baron, 782 E. 93 St., Zone 12, plans by Seeling & Finkelstein, 153 Pierrepont St., Zone 2, 6 story apartment, 298 Linden Blvd. **$575,000.**

●**N. Y., Brooklyn**—Beth-El Hospital, Linden Blvd. and 98 St., Zone 12, plans by Isadore Rosenfield, 19 W. 44 St., New York, Zone 18, hospital bldg., Linden Blvd. and 98 St. **$1,750,000.** CD 1/17/44—ENR 6/1/44.

N. Y., Brooklyn—Colonial Gardens, Inc., 9115 Ridge Blvd., Zone 9, plans by Maxfield Blaufeux, 44 Court St., Zone 2, 6 story apartment, 91-08-24 Colonial Rd. **$515,000.**

N. Y., Brooklyn—David Halpern, 685 Crown St., Zone 13, plans by Lama, Proskauer & Prober, 383 Pearl St., Zone 1, 6 story apartment, 8639-69 Bay Parkway. **$650,000.**

(Continued on page 127)



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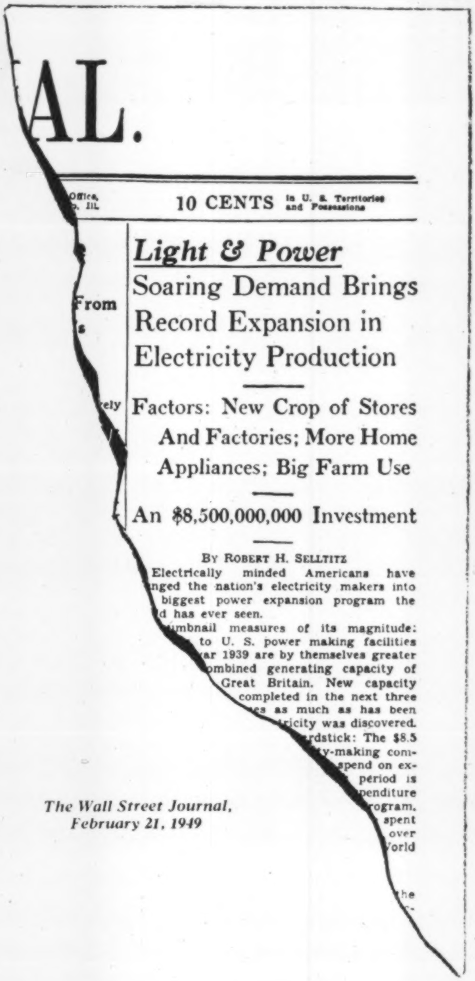

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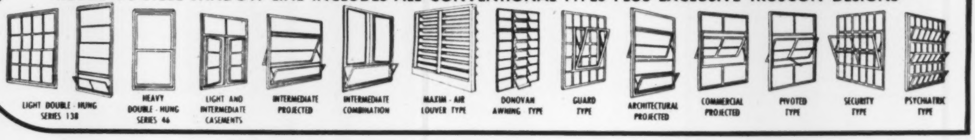
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(Continued from page 124)

●**N. Y., Brooklyn**—Warschauer Haym Solomon Home for the Aged, 136 Second Ave., New York, Zone 3, 12 story home and hospital, Belt Parkway from Bay 34 St. to 23 Ave. **$3,000,000.**

●**N. Y., Brooklyn**—Wyckoff Heights Hospital Society of Brooklyn, 142 St. Nicholas Ave., Zone 27, plans by Crow, Lewis & Wick, 200 Fifth Ave., New York, Zone 10, 6 story hospital, 374 Stockholm St. **$1,178,300.**

●**N. Y., Flushing**—Alley Pond Park Apartments, c/o Arthur Weiser, archt., 240 Madison Ave., New York, Zone 16, 198 houses, Union Turnpike and Springfield Blvd., **$3,340,000.**

N. Y., Forest Hills—M. M. Sorin, c/o Erwin Gerber, archt., 1180 Raymond Blvd., Newark, N. J., apartments, Northside 64 Rd. near 110 St.; North Side 64 Rd. near Grand Central Parkway; South Side Rd. near 110 St., **$307,050.**

N. Y., Forest Hills—Winpark Realty Corp., c/o H. H. Lilien, archt., 201 W. 72 St., New York, Zone 23, apartment, 68 Ave. near Queens Blvd. **$590,000.**

N. Y., Jackson Heights—Parish of Our Lady of the Rosary of Fatima, Jackson Heights, plans by A. F. Meissner, 90-50 Parsons Blvd., Jamaica, parochial school and church, 80 St. and 25 Ave. **$400,000.**

●**N. Y., Jackson Heights**—Queens Heights Land Co., c/o Philip Birnbaum, archt., 303 W. 42 St., New York, Zone 18, apartment, 34 Ave. between 79 and 80 Sts. **$1,950,000.**

N. Y., Jackson Heights—Woodstock House, Inc., c/o Philip Birnbaum, archt., 303 W. 42 St., New York, Zone 18, 6 story apartment, 35 Ave. between 81 and 82 Sts. **$550,000.**

●**N. Y., Kew Gardens**—P. M. L. Co., c/o A. H. Salkowitz, 37-60 82 St., Jackson Heights, 6 apartment bldgs., and 81 houses, 139, 140 and 141 Sts., 68 Drive and Jewel Ave. **$1,616,000.**

N. Y., New York—American Society for Prevention of Cruelty to Animals, Madison Ave. and 24 St., New York, Zone 10, plans by Walker & Poor, 542 Fifth Ave., New York, Zone 19, hospital, York Ave. between 92 and 93 St. **$500,000.**

N. Y., New York—Charles Grunstein, 203 W. 103 St., Zone 25, plans by George W. Swiller, 535 E. Tremont Ave., Zone 57, 3 story apartment, Vireo Ave. near McLean Ave. **$300,000.**

●**N. Y., New York**—Irving Trust Co., 1 Wall St., Zone 5, plans by Carson & Lundlin, 50 Rockefeller Plaza, Zone 20, bank and office, 21-25 W. 51 St. **$1,000,000.**

●**N. Y., New York**—Massachusetts Mutual Life Insurance Co., 1295 State St., Springfield, Mass., plans by Carson & Lundin, 50 Rockefeller Plaza, Zone 20, 21 story office, 5 Ave. and 48 St. on site of St. Nicholas Church. **$7,000,000.**

●**N. Y., New York**—New York Society for Relief of Ruptured & Crippled, 321 E. 42 St., Zone 17, 170 bed hospital on East River Dr. between 70 and 71 Sts. **$3,000,000.**

N. Y., Queens Village—Hillside Estates, Inc., c/o Schulman & Soloway, archts., 4 Court Square, Brooklyn, Zone 2, 16 houses, Hillside Ave., 209 and 210 Sts., **$250,000.**

N. Y., Westbury—St. Brigid's Church, Westbury, 2 story school. **$450,000.**

●**N. Y., Whitestone**—Malba Gardens Homes, c/o Charles N. Whinston, 3 Columbia Pl., Mt. Vernon, 13 houses, Cross Island Parkway and 11 Ave. **$276,000;** 94 houses and 56 garages in area bounded by 5 Ave., 147 St., 3 Ave. and 146 St. **$2,000,000.**

N. C., Winston-Salem—Young Mens Christian Assn., c/o Northrup & O'Brien, archts., Reynolds Office Bldg., Y.M.C.A. bldg. **$500,000.**

N. D., Bismarck—Catholic Church, Bismarck, plans by W. F. Kurke & Assoc., Fargo, high school. **$300,000.**

O., Akron—Lloyd E. Mentzer, pres. Bd. Trustees Sumner Home for Aged, Prospect and Perkins Sts., plans by Wagner & Luxmore, Permanent Bldg., Zone 8, dormitory, **$300,000-$400,000.** CD 2/2—ENR 2/17.

O., Canton—Young Womens Christian Assn., 420 Market Ave. S., Zone 2, plans by Firestone & Motter, 1412 Cleveland Ave. N. W., Y.W.C.A. Bldg., Walnut Ave. and 6 St. N.E. CD 2/2—ENR 2/17.

O., Cleveland — Max Marmorstein, Ninth-Chester Bldg., housing development, Belvoir Blvd. and Cliffview Rd., incl. 7 stores, on 4 acre site. **$300,000.**

●**O., Fairview Park**—Peter Sipper, Jr., 21565 Lorain Rd., plans by George and Henry W. Fox, Union Commerce Bldg., Cleveland, 40 houses, S. Park Rd., 65 homes, W. 229 St. **$1,580,000.**

●**Okla., Oklahoma City**—Steve Pennington, Apco Tower, plans by Albon W. Davis, Apco Tower, 127 houses in Steve Pennington 3rd Addn. **$1,250,000.**

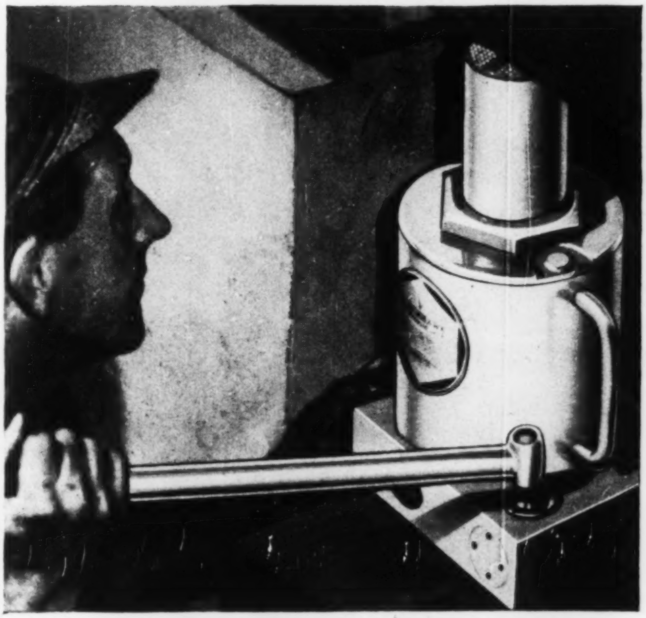
●**Okla., Tulsa**—Roby & Harrison, Marshall Bldg., plans by John Cushing, Marshall Bldg., 8 story, 87 unit apartment hotel, 18 and Boulder Sts. **$1,000,000.**

Pa., Chester—Crozer Hospital, Chester, hospital. **$300,000.**

Pa., Harrisburg—J. W. Kline & Assoc., 210 Walnut St., apartments, Hale Ave. and Mongolia Dr. **$650,000.**

●**Pa., Lansdowne**—Corp. c/o George S. Idell, archt., 117 S. 17 St., Phila., 400 unit, 6 story apartment, Lansdowne Ave. and Pennsylvania R.R. **$2,500,000.**

Pa., Meadville—Fraternal Order of Eagles, 858 Water St., plans by Meyers & Kirder, 407 Commerce Bldg., Erie, 2 story, bsmnt., 66x90 ft. and 2 story, bsmnt., 49x90 ft., brick, steel addns., alterations. **$300,000.**



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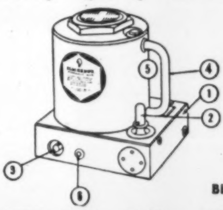

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● New fields in heavy material handling by mobile equipment, are being opened by this giant, rubber-tired two-engined crane. Said to be the world's largest, the first of these Waukesha-Diesel-powered Lorain MC-820 Moto-Cranes is working in the world's largest steel mill. It has a safe-rated lifting capacity of 45 tons (90,000 lb.) at a 12-ft. radius. Thirty years ago when Thew built the first portable crane—also a Waukesha-powered Lorain—its capacity was only 3½ tons. The latest Lorain's ability to lift and transport far heavier loads than any previous portable crane, extends the basic advantages of the moto-crane for handling heavy material in steel mills, steel erection, ship and bridge building, oil fields, logging and many other industries.

A crane is no better than its engines. With their 30 years of motorized crane experience, Thew Shovel Company engineers chose two big Waukesha Super-Duty Diesels to power the world's largest moto-crane. Waukesha Diesels are winning recognition everywhere as the world's finest power plants of their size and type. Get Bulletin 1415.

WAUKESHA MOTOR COMPANY • WAUKESHA, WIS.
NEW YORK • TULSA • LOS ANGELES

Pa., Phila.—Penn Fruit Co., 1919 Chestnut St., supermarket York Rd. and Lindley Ave. **$250,000.**

R. I., Narragansett—Narragansett Development Co., Bonnet Shores, plans by Michael Traficante, 175 Taunton Ave., East Providence, 1 story, 75x135 ft. cabanas, each 40 units, showers and Promenade Deck.

S. D., Sioux Falls—Crippled Children's Hospital & School, Sioux Falls, combined hospital and school. **$500,000.**

●**Tenn., Chattanooga** — Baroness Erlanger Hospital, c/o Aeck & Assoc., archts., 140 Peachtree St., Atlanta, Ga., hospital addn. **$1,800,000.** CD 6/13/46—ENR 6/20/46.

Tex., Alice—Alice Country Club, C. M. Hughett, pres., Alice, plans by Stanley W. Bliss, (archt. for bldg.) 818 Littlefield Bldg., Austin, club house, rein.-con. swimming pool, site grading, levelling, etc. **$250,000.** CD 4/11—ENR 4/21.

Tex., Beaumont — Beaumont Country Club, Colliers Ferry Rd., plans by Stone & Pitts, 1872 Calder St., modernizing, enlarging country club. **$250,000.**

Tex., Beaumont—S. Perry Brown, American Natl. Bank Bldg., low cost (Negro) housing, 35 acres of Caswell tract. **$350,000.**

●**Tex., Beaumont**—S. Perry Brown & Assoc., American National Bank Bldg., addnl. Negro housing. **$2,000,000.**

Tex., Dallas—Baptist Foundation of Texas & Assoc., 1705 Pacific St., masonry, steel, concrete Baptist headquarters, San Jacinto and Ervay Sts. **$550,000.**

●**Tex., Dallas**—W. H. Cothrum & Co., 2116 N. Field St., 408 unit low cost rental (Negro) Housing, 45 two story bldgs., 22 acre site between Hatcher St. and Belt Line. **$1,300,000.**

Tex., Dallas—First Baptist Church, 606 N. Ervay St., plans by John S. Danna, 2618 Cedar Springs St., 4 story, bsmnt. and fdn. for 10 story church, incl. brides rooms. **$500,000.**

Tex., Dallas—Marsalis Development Co., 3224 S. Marsalis St., 135 addnl. dwellings, Oak Cliff. **$825,000.**

●**Tex., Dallas**—Republic National Bank of Dallas, 1315 Main St., 35 story, bsmnt., penthouse, masonry, steel, bank and office. **$4,000,000.** CD 1/14/46—ENR 1/24/46.

●**Tex., Dallas** — Southwestern Bell Telephone Co., 308 S. Akard St., plans by Grayson Gill, 1913 San Jacinto St., masonry telephone bldgs., S. E. Oak Cliff area, **$350,000;** Southwest Oak Cliff area, **$375,000;** Urbandale area, 2nd, **$300,000;** Elam area, **$275,000.**

Tex., Houston—Butler-Grimes, Inc., 1019 N. San Jacinto St., plans by Werlin & Kiefner, 3501 Buffalo Dr., masonry store, Amherst and Kelvin Sts. **$250,000.**

Tex., Houston—H. & D. Constr. Co., 527 N. Adams St., 35 dwellings, El Rancho St. Sect. 3 of Santa Rosa. **$350,000.**

Tex., Houston—Houston Council of Churchwomen, c/o Mrs. W. S. Nicholson, 4950 Linden St., masonry rest home to be known as Holly Hall. **$500,000.**

Tex., Houston—E. M. Hovas, 1816 Hazard St., plans by Woestemeyer & Gaffney, 2351 Claremont Lane, 27 dwellings, Bell-Haven addn. **$275,000.**

Tex., Houston—Mathews Bros., 2904 Quenby St., addnl. 60 dwellings, in Ayshire Addn., Bellaire, Montclair Addn. **$950,000.**

Tex., Houston—Tierwester Oaks, Inc., c/o A. L. Krull, 3501 Rosedale St., addnl. 26 dwellings, Wentworth St. **$250,000.**

Tex., Port Arthur—H. A. Amuny, Port Arthur, 2 story, brick commercial bldg., concrete pier and beam fdn. and frame, 800 block, Proctor St. Approx. **$250,000.**

Tex., Port Arthur—Sears Roebuck & Co., 815 Arnold St., Dallas, plans by George L. Dahl, 2101 N. St. Paul St., Dallas, masonry mercantile store. Approx. **$250,000.** CD 10/22—ENR 11/4.

Tex., San Antonio—Col. Joseph Carmarck & Assoc., 4900 Broadway, plans by Frost Carvel, Travis Bldg., hollow tile, concrete tourist and apartment center, near Olmos Dinner Club, Cleveland Ct. **$300,000.**

Utah, Ogden—Latter Day Saints Church, c/o W. J. Critchlow, chn., Ogden, 320x400 ft. tabernacle. Fred L. Markham, 45 N. University St., Provo, archt.

Wash., Ellensburg—Crescent Homes, Inc., Ellensburg, 50 houses. **$422,500.**

●**Wash., Lacey**—A. G. Homann, Lacey, 100 houses and trading center. **$1,000,000.**

Wash., Seattle—Crest Building, Inc., c/o Carroll, Hillman & Hedlund, Old Times Bldg., Zone 1, plans by Bjarne Moe, 2318 2 Ave., Zone 1, 1 story theater. **$250,000.**

Wash., Selah—Selah Homes, Inc., Selah, 49 houses. **$400,000.**

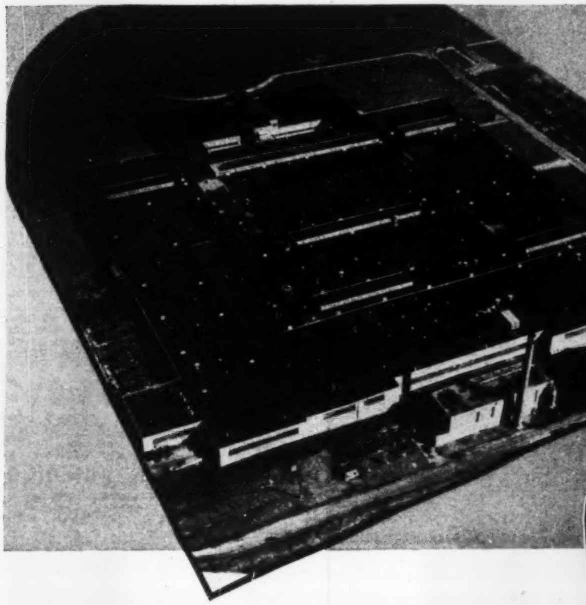
Wash., Wenatchee—First Methodist Church, Wenatchee, church. **$300,000.**

W. Va., Parkersburg — St. Francis Xavier Roman Catholic Congregation, Parkersburg, plans by Ramsey & Croce, 6 W. Frambes Ave., Columbus, O., 2 story, bsmnt., 114x120 ft., brick parochial high and grade school. **$300,000.**

Wis., Appleton—Lawrence College, 112 S. Union St., plans by R. Philipp, 756 N. Broadway, Milwaukee, Zone 2, 1 story Worcester Art Center. **$280,000.**

Wis., Madison—First Baptist Church, 1806 Vilas Ave., plans by Weiler & Strang, 114 N. Carroll St., church. Approx. **$300,000.**

(Continued on page 130)



THE YALE & TOWNE MFG. CO

JOB DATA

Architect: The Ballinger Co.

General Contractor: Turner Construction Co.

Roofing Contractor: Warren-Ehret Co.

Roof Deck: Truscon Steel

Roof Insulation: Fiberglas Roof Insulation, 1" thick, 750,000 square feet on factory and office building

Roofing: 20 years Bonded Slag Roof

Insulated for 3-way economy with

FIBERGLAS* ROOF INSULATION

Yale & Towne Manufacturing Co., specified Fiberglas Roof Insulation for its new plant in order to get 3-way economy—of installation, of performance, of maintenance.

Competitively priced with ordinary organic materials, the installed cost of Fiberglas Roof Insulation is easy on the budget.

Because of its superior insulating efficiency, Fiberglas Insulation gives you increased savings in heating and air-conditioning costs.

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For 3-way economy in your roofs, specify Fiberglas Roof Insulation. Applied by leading roofing contractors everywhere. Write for manual. Owens-Corning Fiberglas Corporation, Dept. 952, Toledo 1, Ohio. In Canada: Fiberglas Canada Ltd., Toronto, Ontario.

PRODUCT DATA

Thermal Efficiency:
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Efficiency unimpaired after laboratory equivalent of 75 years of weathering.

Dimensional Stability:
Basically composed of glass fibers. Will not warp, swell, shrink or buckle.

Light Weight:
Weighs only 1.31 lb./sq. ft. in 1" thickness.

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With Hypressure Jenny you can clean—right on the job—heavy-duty field equipment fouled with mud, muck and grease, thus promoting faster, more efficient operation. You can put machinery, shopped for repairs, back on the job 40% quicker if you Hypressure Jenny steam clean it before your mechanics start working on it. Compact, portable, efficient Hypressure Jenny is ready to work instantly—on the job or in the shop—in less than one minute after pressing the starting switch. Cleaning is accomplished by a highly atomized mixture of steam, hot water and cleaning compound applied under pressure through an adjustable spray gun. Hypressure Jenny cleans thoroughly and fast—10 times faster than by hand methods . . . is safe, simple, easy to operate.

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HYPRESSURE JENNY DIVISION
HOMESTEAD VALVE MFG. CO.
P. O. BOX 31 CORAOPOLIS, PA.

(Continued from page 128)

Alta., Edmonton—Bank of Montreal, St. James St., Montreal, Que., office addn. **$400,000.**

Alta., Edmonton—E. I. Clarke, 9140 116 St., office, 102 St. **$500,000.**

●**Ont., Ottawa**—Grey Nuns of the Cross, Sussex St., hospital addn., Approx. **$2,000,000.**

Ont., Toronto—Royal Canadian Military Institute, 426 University Ave., 3 story, rein.-con. steel, brick, stone bldg. **$500,000.**

Que., Des Biens Mills—Reverand Redemptorist Fathers, Ste. Anne de Beaupre, plans by L. Desgagnes, 181 Racine St., Chicoutimi, monastery. **$400,000.**

Que., Hull—Bell Telephone Co. of Canada, 1050 Beaver Hall Hill, Montreal, plans by Hazelgrove & Lithwick, 53 Queen St., Ottawa, Ont., telephone exchange bldg., St. Laurant St. Approx. **$500,000.** CD 8/27—ENR 9/9/48.

●**Que., Lachine**—S. D. Gameroff, 1069 Notre Dame St., 300 houses, Grove Hill Golf Course, Approx. **$2,100,000.** CD 3/5/47—ENR 3/20/47.

●**Que., Quebec City**—J. L. A. Godbout, 2081 Benoit Bldg., hotel, **$1,000,000.**

Que., Quebec City—Industrial Life Insurance Co., A. F. Mutch, genl. mgr., 319 Blvd. Charest, plans by M. Bouchard & P. Rinfret, 400 Blvd. Charest, 2 story, bsmnt., 138x295 ft. rein.-con. steel office bldg., St. Louis Rd. Approx. **$500,000.** CD 12/26/46—ENR 1/2/47.

●**Que., Quebec City**—St. Augustine Hospital Bd., c/o Judge T. Tremblay, hospital, **$3,000,000.**

Que., Verdun—Catholic School Comn., 3509 Wellington St., plans by J. A. Dutrisac, 1069 Beatty Ave., 3 story, concrete, steel, brick, stone school, Beurling Ave. **$900,000.**

INDUSTRIAL BUILDINGS

●**Ky., Louisville**—WAREHOUSE, etc.—Great Atlantic & Pacific Tea Co., 420 Lexington Ave., New York, 17, N. Y., warehouse, office and plant. **$1,700,000.**

La., Lake Charles—PLANT—Citizens Publishing Co., c/o Dunn & Quinn, archts., Lake Charles, printing plant. **$500,000.**

Md., Baltimore—MILL—Maryland Lumber Co., 1100 E. Fayette St., plans by Harry D. Katz, 3212 Gwynns Falls Parkway, 1, 2 and 3 story, 100x183 ft., brick, concrete, steel office, showroom and mill, Center St. and Fallsway.

Minn., St. Paul—WAREHOUSE—Cities Service Oil Co., B. W. Horne, supt., 500 Robert St., 1 story, 160x260 ft. warehouse, Thomas and Fairview Aves. **$250,000.**

●**Mo., St. Louis County**—PLANT—Union Electric Co. of Missouri, 315 N. 12 Blvd. St. Louis, Zone 1, rein.-con., steel power generating plant, near junction of Meramec and Mississippi Rivers, southern part St. Louis Co. **$26,000,000.**

Neb., Omaha—PLANT—Abbas Processing Co., R. F. D. 1, Council Bluffs, Ia., will not construct rendering plant 28 and Q Sts. **$150,000.** Project abandoned. Willis Regier, 4502 S. 36 St., engr. and archt. CD 1/10—ENR 2/3.

Neb., Omaha—WAREHOUSE—Baker Mfg. Co., Evansville, Wis., branch warehouse. **$100,000.**

N. Y., Brooklyn—PLANT—Hearst Corp., New York Mirror Div., 235 E. 45 St., New York, Zone 17, plans by Lockwood Greene Engineers, Inc., 10 Rockefeller Plaza, New York, Zone 20, 5 story newspaper plant alterations, 540 Atlantic Ave. **$300,000.**

N. Y., Brooklyn—PLANT—The Printing Building Co., Inc., 290 Broadway, New York, Zone 7, plans by Freed & Gordon, 624 Madison Ave., New York, Zone 22, 4 story printing plant alterations, 216 Nevins St. **$150,000.**

N. Y., Long Island City—WAREHOUSE—General Electric Appliances, Inc., Boston Ave. and Bond St., Bridgeport, Conn., plans by J. G. Phelan, 211 State St., Bridgeport, Conn., 2 story warehouse, Northern Blvd. near 48 St. **$600,000.**

N. Y., Long Island City—FACTORY—24 Street Plaza Realty Corp., c/o David Levy, archt., 70 E. 45 St., New York, Zone 17, factory, Bridge Plaza south near 24 St. **$270,000.**

N. Y., New York—SHOWROOM, etc.—Drosmore Corp., 1896 Broadway, Zone 23, plans by Herman Kron, 1451 Broadway, Zone 18, auto showroom and offices. **$100,000.**

N. Y., New York—PLANT—Pioneer Ice Cream Div., Borden Co., 205 E. 24 St., Zone 10, plans by G. Norman Robinson, 25 W. 43 St., New York, Zone 18, ice cream storage and shipping plant alterations, 19-21 W. 141 St. **$238,000.**

N. Y., New York—FACTORY, etc.—Roux Distributing Co., 1841 Park Ave., Zone 35, plans by Walter M. Cory, 29-28 41 Ave., Long Island City, 3 story factory and office, 153 St. and River Ave. **$950,000.**

N. Y., New York—STORAGE GARAGE—Skyway Auto Ramp, Inc., 739-41 Broadway, Zone 3, plans by Henry George Greene, 1741 Broadway, Zone 18, storage garage alterations. **$100,000.**

●**N. Y., Syracuse**—PLANT—General Electric Co., Seventh North and Hopkins Rd., 74,000 sq. ft. television tube plant, Electronic Park. **$1,000,000.**

N. Y., Woodside—GARAGE—Paragon Oldsmobile, Inc., 57-02 Northern Blvd., plans by Oswald Fischer, 31-12 Broadway, Long Island

City, 1 story garage and showroom, Northern Blvd. and 57 St. **$115,000.**

●**O., Lancaster** — PLANT — Diamond Power Specialty Corp., Willis P. Thomas, pres., 10340 Oakland St., Detroit, Mich., plant mfg. industrial television sets and power plant boiler accessories on 37 acre tract on U. S. 22, 2 mi. east of here. **$1,500,000-$2,000,000.**

Okla., Miami—WAREHOUSE—B. F. Goodrich Co., Miami, 200,000 sq. ft. finish goods warehouse **$400,000.**

●**Pa., Phila.**—RESEARCH LABORATORY—E. I. du Pont de Nemours & Co. Inc., du Pont Bldg., Wilmington, Del., 4 story L shaped, 129x216 ft., red brick laboratory, air-conditioned, Grays Ferry Rd. **$2,000,000.**

Pa., West Point — RESEARCH LABORATORY—Sharp Dohme, 640 N. Broad St., Phila., research laboratory. Approx. **$250,000.** John M. Waligora, c/o owner, ch. engr

●**Tex., Corpus Christi**—GRAIN ELEVATOR—Louis E. Meekins, 1101 N. E. 23 St., Fort Worth, 1½ m. bu. grain elevator. **$1,750,000.** Faleide Eng. Co., 53 W Jackson St., Chicago, Ill., consult engr.

Tex., Houston—PLANT—Phillips Chemical Co., c/o City Natl. Bank Bldg., fertilizer plant expans. **$500,000.**

Tex., Houston—SERVICE STATIONS—Sinclair Refining Co., Gulf Bldg., 12 units masonry auto service stations. **$225,000.**

●**Tex., Palestine**—PLANT—Glidden Co., Berea and Madison Sts., Cleveland, O., food plant. **$1,500,000.**

Wash., Tenino — PLANT — Pacific Powder Co., Tenino, 3 new bldgs. at powder plant. **$150,000.**

Wash., Yakima—PLANT—Richey & Gilbert Co, Mead Ave. at Union Pacific Ry., plans by John Petter, Yakima, palletized packing and storage plant. **$150,000;** deep freeze and canning plant. **$350,000.**

Wis., Grafton—PLANT—Jungers Stove & Range Co., Grafton, plans by W. G. Memmler, 1825 E. Hartford Ave., Milwaukee, Zone 11, 1 story, 65x145 ft. steel, concrete block storage bldg., concrete fdn.; 1 story, 40x72 ft., steel, concrete block crating room, concrete fdn., 17x40 ft. concrete loading platform

Wis., Rhinelander — WAREHOUSE—Starks Farms, Rhinelander, 1 story, 60x200 ft., rein.-con. potato warehouse. Genisot Eng. Co., 1512 N. Eagle St., consult. engr

●**Philippines, Maria Christina Falls**—PLANT—Aluminum Ltd., Sun Life Bldg., Montreal, Que., plant for processing bauxite ore from Malaya. **$10,000,000.**

●**Ont., Port Edward (Postal Dist. Sarnia)**—FREIGHT SHEDS—Canadian National Railways, B. Wheelwright, ch. engr., 360 McGill St., Montreal, Que, and Canada Steamship Lines, Montreal, Que., freight sheds. **$1,000,000.**

●**Ont., Toronto**—PLANT—Canadian S-K-F Co. Ltd., G. James, pres., 1057 Bay St., plant, Birchmount Rd., Scarborough, Approx. **$1,000,000.**

UNCLASSIFIED

●**Ala., Florence**—GAS SYSTEM—City, natural gas sys., **$1,000,000.** Barnard & Burk, Triad Bldg., Baton Rouge, La., consult. engrs.

Arkansas—RURAL DISTRIBUTION LINES—Riceland Electric Co-operative, Stuttgart, 157 mi. rural distr. lines, sys. imprvs., warehouse facilities, two-way radio communication sys. and completion previously approved constr., Arkansas Co. **$370,000** Southwest Electric Engineers, Jonesboro, consult. engr. CD 4/13.

Calif., Los Angeles — UNDERGROUND SHOWER, etc.—Los Angeles Memorial Coliseum Comn., 3911 S. Figueroa St., plans by Bennett & Bennett, 1165 E. Colorado St., Pasadena, rein.-con. underground shower and locker room, **$175,000.**

Florida—RURAL DISTRIBUTION LINES—Gulf Coast Electric Cooperative, Wewahitchka, 65 mi. rural distr. line, sys. imprvs., and completion previously approved construction, Bay Co. **$165,000.**

Georgia—RURAL DISTRIBUTION LINES—Flint Electric Membership Corp., Reynolds, 445 mi. rural distr. lines, sys imprvs., Taylor Co. **$880,000.**

Illinois—RURAL DISTRIBUTION LINES—Edgar Electric Co-operative Assn., Paris, addnl. rural distr. lines, sys. imprvs., Edgar Co. **$315,000.**

Illinois—RURAL DISTRIBUTION LINES—Illinois Electric Co-operative, Champaign, 5 mi. 69 KV transmission lines, headquarters facilities, Champaign Co **$198,000.**

Indiana—RURAL DISTRIBUTION LINES—Harrison Co Rural Electric Membership Corp., Corydon, 17 mi. rural distr. lines, sys. imprvs., Harrison Co **$120,000.**

Indiana—RURAL DISTRIBUTION LINES—Southern Indiana Rural Electric Co-operative, Tell City, 80 mi. rural distr. lines, sys imprvs., Spencer Co. **$180,000.**

Indiana—RURAL DISTRIBUTION LINES—Steuben Co. Rural Electric Membership Corp., Angola, 31 mi rural distr. lines, headquarter facilities, sys. imprvs., Steuben Co. **$195,000.**

Iowa—RURAL DISTRIBUTION LINES—Greene Co. Rural Electric Co-operative, Jefferson, rural distr. lines, Greene Co. **$243,000.** Brown Eng. Co., K. P. Bldg., Des Moines, engr.

THE CONCRETE VIBRATOR WITH THE 50 FT. REACH

A WHALE OF A TIME-SAVER ON THOSE HARD-TO-GET-AT JOBS, AND GENERAL CONSTRUCTION, TOO!

The Jackson Hydraulic

The 50' hose length makes frequent changes of location unnecessary, keeps the machine working, greatly reduces non-productive time. Interchangeable fittings permit reversing the hose whenever wear makes it desirable. No troublesome parts to break. All parts run in oil. No lubrication problem. Husky Wisconsin engine. Frequency instantly adjustable from 4,000 to 7,000 VPM.

BUY OR RENT this unexcelled vibrator from your nearest Jackson Distributor

ELECTRIC TAMPER & EQUIPMENT COMPANY • Ludington, Mich.

ASSEMBLY LINE ERECTION of eighteen large sludge digestion tanks speeds construction at the Los Angeles sewage plant.

Hyperion Digesters Are Mass-Produced

"Mass production" of the 18 sludge digestion tanks for the Los Angeles sewage treatment plant has been made possible by use of steel forms permitting efficient concrete placing and because the design included a wire-wrapped prestressing system This prestressing permits the 33-ft side walls of the 111-ft dia. digesters to be cast in quarter-sections with vertical joints. The tanks will have conical bottoms and domed roofs.

The $3,991,000 contract—held by the Pacific Bridge Co.—for construction of the digester system at Hyperion is only one of several contracts now under way on the new 245-mgd activated-sludge plant (ENR May 29, 1947, vol. p. 874) Other work in progress on the plant—intended to remedy the pollution of 10 miles of beaches—includes a mile-long, 12-ft dia outfall (ENR Aug 5, 1948, p 64), a headworks building, a filter and dryer building, primary settling tanks, a power and blower building and the moving of 14,000,000 cu.yd of sand from the plant site

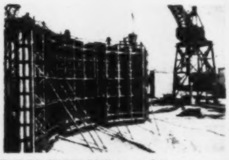
Two alternates were allowed for the tank walls when bids were called tanks of conventional reinforced concrete design, or tanks built by the wire-wrapped prestressing each alternate, th tems were pe ers, flat sl accepted

R are be p o

for easier construct and more effective heat insulation

Wrapping wire us is initially 0.162 in dia During he wrapping the wire is drawn dow a diameter of about 0.142 in T stressing increases the length of 0-lb., 3,700 ft wire bundle to 6,0

In this manner a s of 130,000 to 150,000 psi



THREE-SECTIONS of steel forms are used for one-quarter of the inside of a digester wall. Casting tanks in four parts is permissible because of wire wrapping.

with ATLAS SPEED FORMS

IRVINGTON FORM & TANK CORPORATION
IRVINGTON 7 NEW YORK

ENGINEERING NEWS-RECORD • April 14, 1949

Iowa — RURAL DISTRIBUTION LINES — Monona County Rural Electric Co-operative, Onawa, 72 mi. rural distr. lines, sys. imprvs., 13 mi tie lines, two-way radio communication sys., Monona Co. **$285,000.** Brown Eng. Co., K. P. Bldg., Des Moines, engr. CD 6/5/47—ENR 6/26/47

Iowa — RURAL DISTRIBUTION LINES — Wright County Rural Electric Co-operative, Clarion, rural distr. lines, Wright Co. **$200,000.** P. L. Burns, 630 Davenport Bank Bldg., Davenport, consult. engr.

Kansas—RURAL DISTRIBUTION LINES—C. M S. Electric Co-operative, Meade, 279 mi. rural distr. lines, sys. imprvs., Meade Co. **$410,000.**

●**Kansas and Colorado**—PIPELINE—Colorado Interstate Gas Co., Continental Oil Bldg., Denver, Colo., 38 mi. pipeline from Hugoton Gas field, Kan., to Denver, Colo., **$4,328,930.**

Kansas—RURAL DISTRIBUTION LINES—Flint Hill Rural Electric Co-operative Assoc., Council Grove, 174 mi. rural distr. line. sys. imprvs., Morris Co. **$610,000.**

Kansas—RURAL DISTRIBUTION LINES—Ninescah Rural Electric Co-operative, Pratt, 600 mi. rural distr. lines, 4 sub-stations, Pratt and 8 adjacent counties, **$935,000.** Richardson Electrical Eng. Co., Solomon, engr. CD 6/28/46—ENR 7/11/46.

Kansas—RURAL DISTRIBUTION LINES—Radiant Electric Co-operative, Fredonia, 201 mi. rural distr lines, sys. imprvs, Wilson Co. **$325,000.**

Louisiana—RURAL DISTRIBUTION LINES—Claiborne Electric Co-operative, Homer, 92 mi rural distr. lines, Claiborne Co., **$340,000.** George C. Hengy, State Bank Bldg., Shreveport, engr. CD 4/7/48—ENR 4/29/48.

Louisiana—RURAL DISTRIBUTION LINES—Concordia Electric Co-operative, Ferriday, 183.5 mi. rural distr lines, 16.5 mi. 33 KV transmission lines, sys. imprvs., 11 mi. tie lines, Concordia Co. **$570,000.**

La., Kentwood—NATURAL GAS SYSTEM—Town, Town Hall, voted **$290,000** bonds, natural gas sys. CD 4/8.

Maine—RURAL DISTRIBUTION LINES—Swan's Island Electric Co-operative, Swan's Island, 27 mi. rural distr. lines, generating facilities, etc., Swans Island Co. **$126,000.**

Minnesota—RURAL DISTRIBUTION LINES—Beltrami Electric Co-operative, Bemidji, 103 mi. rural distr. lnes, sys. imprvs., Beltrami Co. **$360,000.**

Minnesota—RURAL DISTRIBUTION LINES—Border Counties Power Corp. Warroad, 33 mi. 34½ kv. transmission lines from Warroad to Pitt, Minn 99 H Lake of the Woods Co **$190,000.** General Eng Corp., 2950 Chicago Ave., Minneapolis, consult. engr. CD 10/11—ENR 10/28.

●**Minnesota**—RURAL DISTRIBUTION LINES—Northern Electric Co-operative Assn., Virginia, sys. imprvs, 393 mi. rural distr. lines, 15 mi. tie lines, 26 mi transmission lines, headquarter facilities. **$1,185,000.** General Eng. Corp., 2950 Chicago Ave., Minneapolis, consult. engrs.

Minn., Bemidji—RURAL DISTRIBUTION LINES—Beltrami Electric Co-operative, Earl Larson, mgr., Bemidji, imprv, rural distr. lines, Beltrami Co. **$360,000.** CD 6/23/47—ENR 7/10/47.

Mississippi—RURAL DISTRIBUTION LINES—Singing River Electric Power Assn., Lucedale, 214 mi. rural distr. lines, sys imprvs., Jackson Co **$425,000.** CD 8/23—ENR 9/9.

Missouri—RURAL DISTRIBUTION LINES—Atchison-Holt Electric Co-operative, Rockport, 48 mi. rural distr lines, sys. imprvs., Atchison Co. **$280,000.** Henningston Eng. Co., Standard Oil Bldg., Omaha, Neb., consult engr. CD 5/2.

Missouri—RURAL DISTRIBUTION LINES—Ozark Border Electric Co-operative, Poplar Bluff, 85 mi. rural distr. lines, sys. imprvs., Butler Co. **$150,000.** CD 6/26/48—ENR 7/8/48.

Nebraska, Iowa and Illinois — TEST TOWERS—Northwestern Bell Telephone Co., 19 and Douglas Sts., Omaha, Neb., test towers at Omaha, Neb., Chicago Ill., and approx. 18 towers at various points between the two cities for radio relay sys. Approx. **$500,000.** A L. Turner, c/o owner, ch engr.

●**Nebraska**—RURAL DISTRIBUTION LINES—Dawson County Public Power Dist., Lexington, rural distr. lines, Dawson Co. **$1,580,000.** Raymond H Reed & Co., Columbus, consult. engrs. CD 3/17/48—ENR 4/15/48.

Nebraska—RURAL DISTRIBUTION LINES—Franklin County Electric Membership Corp., Franklin, rural distr lines, Franklin Co. **$125,000.** H. S. Nixon Eng. Co., W O. W. Bldg., Omaha, consult. engr.

Nebraska—RURAL DISTRIBUTION LINES—North Central Nebraska Rural Public Power Dist., Creighton, 363 mi. rural distr. lines, sys. imprvs., completing previously approved constr., Holt Co. **$650,000.**

Nebraska—RURAL DISTRIBUTION LINES—South Central Membership Assn., Nelson, 235 mi rural distr lines, Webster Co. **$163,000.**

New Mexico — RURAL DISTRIBUTION LINES—Sierra Electric Co-operative, Hillsboro, 92 mi. rural distr. lines, sys. imprvs., completing previously approved construction, Sierra Co. **$175,000.** CD 1/10/46—ENR 1/24/46.

N. Y., New York—PARK—Dpt Parks, Arsenal Bldg., Central Park, 64 St. and 5 Ave., Zone 21, 1 story pump bldg., **$11,500;** 1 story transformer bldg., **$41,000;** 1 story recreation bldg. and playground, **$85,850,** at Ferry Point Park. Andrews & Clark, 305 E. 63 St., Zone 21, consult. engrs. CD 10/18/44—ENR 11/2/44.

●**North Dakota** — RURAL DISTRIBUTION LINES—K. E. M. Electric Co-operative, Linton, 670 mi. rural distr. lines and completing previously approved construction, Emmons Co. **$1,045,000.** Ulteig Eng. Corp., 1114½ Front St., Fargo, consult. engr.

N. D., Grand Forks—FIELD HOUSE—State Bd. Higher Educ., Bismarck, plans by T. B. Wells, Grand Forks, field house at University of North Dakota. **$875,000.**

Ohio—RURAL DISTRIBUTION LINES—Tri-County Rural Electric Co-operative, Napoleon, 20 mi. rural distr. line and sys. imprvs., Fulton Co. **$230,000.** CD 9/24/47—ENR 10/16/47.

Pennsylvania — RURAL DISTRIBUTION LINES—Central Electric Co-operative, Parkers Landing, 84 mi. rural distr. line, headquarters facilities and sys. imprvs., Armstrong Co. **$335,000.**

South Dakota — RURAL DISTRIBUTION LINES—Central Electric Assn., Pierre, 434½ mi. rural distr. line for acquisition and rehabilitation of 1½ mi. rural distr. lines Village of Agar, and for 21 mi. transmission line, Hughes Co. **$775,000.**

South Dakota — RURAL DISTRIBUTION LINES—Upper Grand River Electric Assn., Lemmon, 455 mi. rural distr. line, acquisition and rehabilitation generating plant and 2½ mi. rural distr. line, town of Bison, construct 3½ mi. transmission line, Perkins Co. **$620,000.**

Texas—RURAL DISTRIBUTION LINES—Farmers Electric Co-operative, Greenville, rural distr. lines, Hunt Co. **$470,000.**

Texas—RURAL DISTRIBUTION LINES—Jackson Electric Co-operative, La Ward, rural distr. lines, Jackson Co. **$350,000.** CD 1/19—ENR 2/3.

Texas—PIPELINE—Pasotex Pipe Line Co., 2411 N. Field St., 22 mi. 6 in. crude oil pipeline between Snyder fields and Colorado City, Scurry Co. **$200,000.**

Tex., Dallas—RECREATION CENTER—J. W. & Jimmie, Jr., Marshall, Buckner Blvd. and Lake June Rd., recreation center and bowling alley in Homer W. Snowden acreage east of city. **$100,000.**

Tex., Houston — CAMP — Boy Scouts of America, West Bldg., camp imprvs., incl. grading, drainage, playgrounds, rehabilitation work. **$112,422.**

Tex., Pasadena—STADIUM—Pasadena Independent School Dist., Pasadena, 7,300 seating capacity stadium. **$125,000.**

†**Washington** — TRANSMISSION LINE—Bonneville Power Admin., 729 Northeast Oregon St., Portland, Ore., 7 mi. transmission line to Keokuk Metals plant from Grand Coulee power line, Douglas Co. **$250,000.**

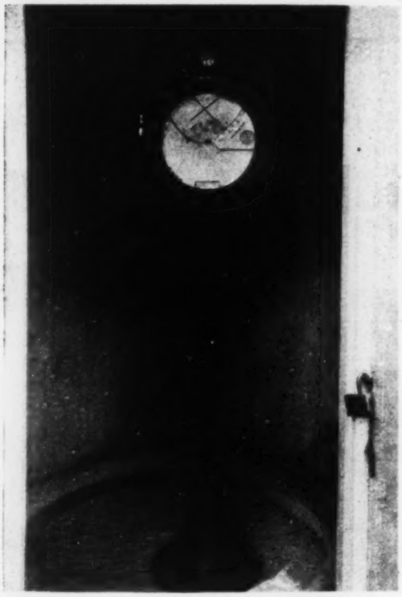
Washington — RURAL DISTRIBUTION LINES—Columbia County Rural Electric Assoc., Dayton, 44 mi. rural distr. line and sys. imprvs., Columbia Co. **$101,000.**

●**Washington** — RURAL DISTRIBUTION LINES—Public Utility Dist. 1 of Douglas Co., Bridgeport, acquisition and rehabilitation 50 mi. 33 kv transmission line, 82 mi. rural distr. line for 265 mi. rural distr. line, sys. imprvs., incl. 36 mi. 33 kv transmission line and completing previously approved constr., Douglas Co. **$2,318,000.**

British Columbia—TRANSMISSION LINES—West Kootenay Light & Power Co. Ltd., Trail, 60 kv. transmission line between Kootenay River sys. and Creston in East Kootenay areas, **$375,000;** transmission and distr. sys. addns., incl. two 15,000 kva. regulating transformers at Oliver, 22 mi. 60 kv. transmission line between Penticton and Summerland, sustation at Summerland, 1,500 kva. step-down units in rural load centers, Okanagan Valley area. **$500,000.**

Man., Winnipeg—PLAYGROUND—Municipality, ratepayers to vote soon playgrounds, **$500,000.** W. D. Hurst, city engr.

This Bailey Open Channel Meter indicates, records and integrates sewage flow at a midwest plant. Wall or panel mounted registers are also available.



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A Reliable Register for Low Cost, Trouble-Free Service

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6. Easy to Install
7. Easy to Maintain
8. Simple Chemical Feed Controls
9. Rate of Flow and Ratio Controls

Bailey Open Channel Meters indicate, record and integrate the flow of sewage, sludge, industrial wastes and irrigation water. They may be used with all types of flumes, weirs and open flow nozzles.

Electronic or direct mechanical registers may be furnished. Electric, electronic or air control may be provided.

Write for Bulletin 62

MU-24

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A MOUTHFUL AT EVERY BITE

Engineering Facts about

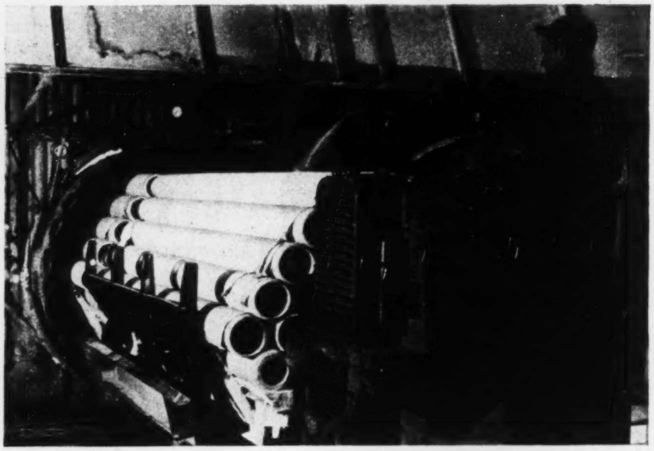
Johns-Manville TRANSITE* PRESSURE PIPE

Resistance to Corrosion

. . . an index of long life

Ability to withstand corrosion is the most important single measure of the durability or life expectancy of an underground water pipe material. Two factors—both inherent in the pipe itself—contribute to Transite's exceptional ability to resist corrosion. These are:

1. **The inherently corrosion-resistant materials of which Transite is made.**
2. **The specially developed manufacturing process — employed exclusively by Johns-Manville—which imparts a high degree of chemical stability to the finished product.**



A load of Transite Pipe about to enter the steam curing tanks. This step in the Johns-Manville manufacturing process contributes substantially to the corrosion resistance of the finished pipe—and, therefore, to its long service life.

Transite Pipe was first used by this large west coast city in 1933. Its exceptional corrosion resistance—an index of long life—has already made it possible for Transite to outlive other pipe several times over.

In the manufacture of Transite Pipe, the three basic ingredients, asbestos fibres, cement and silica—all basically corrosion-resistant by nature—are consolidated under tremendous pressure to form a pipe wall of dense, uniform, homogeneous structure. After forming, the pipe is subjected to a special steam curing process.

It is in this steam curing stage that so much is contributed to the stability and structural integrity of the pipe. Here under the action of pressure steam, Transite assumes a new chemical identity. The silica unites chemically with the free lime ordinarily associated with cement products and converts it into highly stable calcium silicates. As a result of this process, the cured pipe is unusually resistant to corrosive attack throughout its entire structure.

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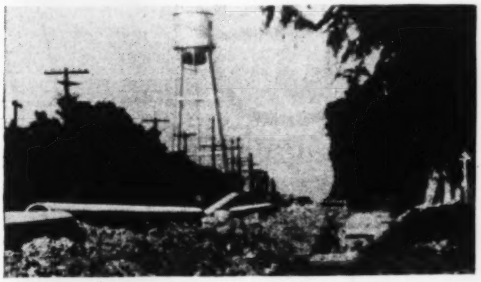
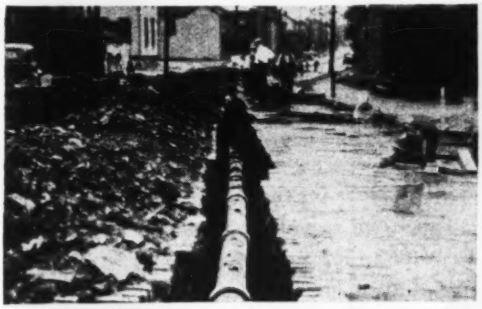
*Transite is Johns-Manville's registered trade mark for its asbestos-cement pipe and other products.

This intrinsic resistance to corrosion has been substantiated by numerous Transite installations. Some of these have been exposed to highly aggressive soils, both alkaline and acid, for many years. Many are now serving as replacements under conditions so destructive that the useful life of the pipe materials previously used had been seriously curtailed.



Transite Pipe was installed in this Texas city ten years ago to replace another pipe material that had been destroyed by soil corrosion in 7 years. The Transite mains are still on the job today with a long useful life ahead of them.

In one such installation, a Transite main installed during 1932 in an extremely corrosive soil was recently made the subject of careful study to determine its condition. Sections of the pipe, including couplings, were dug up and shipped to the factory for test. There was no evidence of deterioration. Pipe and couplings readily withstood the original factory pressure test, equivalent to four times the normal working pressure of the line.

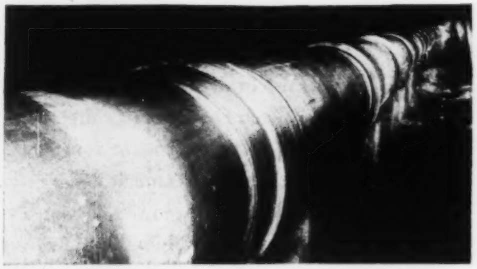


Like thousands of other communities, this West Virginia city selected Transite Pipe because it promised assurance of maximum life. Today, after 14 years of service, the first installation of Transite has already fulfilled this promise by outlasting the pipe material previously used.

Certain types of industrial service provide an even more severe "proving ground" for the life expectancy of pipe materials, and here, too, Transite Pipe has demonstrated exceptional corrosion resistance. Coal mine service is a typical example. Here acid mine waters are frequently so corrosive that they have destroyed ordinary pipe materials in a matter of a few months or years. Yet Transite Pipe has handled these same waters under working pressure up to 150 lbs. for periods from 10 to 15 years with little, if any, indication of deterioration.

Corrosive soil conditions were so severe at this location in a prominent New England city that the life of the pipe material formerly used was only 15 years. Transite Pipe, put in as a replacement in 1934, continues to give the same efficient, dependable service as the day it was installed.

To evaluate the ability of pipe materials to withstand soil corrosion, the National Bureau of Standards has conducted an extensive series of field tests. These studies are based on examination of hundreds of pipe samples periodically removed from severely corrosive soils. In these and similar tests, Transite Pipe has consistently demonstrated its superior resistance to soil corrosion, confirming the long life expectancy which this asbestos-cement pipe has evidenced in thousands of water works installations.



Transite's ability to provide long-term, dependable service is well illustrated by its performance in coal mines, where it consistently outlasts other pipe materials in carrying corrosive mine drainage waters. The 36" Transite line shown above has been conveying acid mine waters for 15 years.

For further details about Transite Pressure Pipe, write Johns-Manville, Box 290, New York 16, N. Y.

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CONSTRUCTION REPORTS-Second Section

Third Section Construction Reports on page 152

WATER SUPPLY

BIDS ASKED

About June 1

Ark., Wynne—City, WW imprvs., extens. $125,000. Marion L. Crist & Assoc., Union Life Bldg., Little Rock, engrs. CD 4/11—ENR 4/28.

June 1

Ga., Emerson—City, WW distr. sys., pump. station, storage tank, approx. $50,000. Merritt & Welker, 206 Roswell St., Marietta, engrs.

Miss., Mendenhall — Town, W. E. Kennedy, clk., City Hall, water well.

N. Y., New York—Bd. Water Supply, 120 Wall St., Zone 5, furnishing, testing, del. one 5-ton and three 3-ton electric traveling cranes, appurtenances for Rondout, West Branch and Kensico South effluent chambers of the Delaware Aqueduct.

Okla., Henryetta—City, 27,000 lin. ft. c. i. watermain extens. $65,000. Plans deposit $10. L. M. McGoodwin, Fayetteville, Ark., engr.

June 2

N. J., Margate — City Comrs., City Hall, reservoir for WW. Plans deposit $25. CD 4/27—ENR 5/5.

June 3

†Oregon—U. S. Eng., 19 E. Poplar St., Walla Walla, Wash., furnish, install and test pumps, appurtenances for well, at McNary, Serial No. Eng-45-164-49-95.

Pa., Cambridge Springs—Cambridge Springs Boro, setting and connecting pumps, concrete lining and clearwell, sedimentation basins, electrical wiring and appliances and rebuilding filter beds. Plans deposit $20. Hill & Hill, 24 E. Main St., North East, engrs.

S. D., Hoven—City, water sys., incl. well, elevated tank, pump and pump house and distribution. $30,000. Scott Eng. Co., Box 312, Watertown, engr.

June 7

Miss., Shelby — Town, Town Hall, WW imprvs. Plans deposit $5. W. M. Thomas, Cleveland, engr.

SOON LETS CONTRACT

Tex., Port Lavaca — Calhoun Development Co., Port Lavaca, soon lets contract 10,000 lin. ft. 2- to 6-in. c.i. watermains. $35,000. Wyatt C. Hedrick, 5201 Fannin St., Houston, engr.

Tex., San Antonio—E. J. Burke & Sons, Inc., 4220 S. Zarzamora St., soon lets contract addnl. c. i. waterlines, facilities, N. New Braunfels Ave. between Austin Hy. and WOW Hospital. $45,000. W. D. Van Der Heck, 4200 S. Zarzamora St., consult. engr. W. E. Simpson, Milam Bldg., engr.

Va., Clarksville—Colonial Mills, Inc., Clarksville, soon lets contract filtration plant addn. Plans deposit $25. E. M. Freeman Engineers, Inc., High Point, N. C., engr.

LOW BIDDERS

Ala., Decatur — City, May 12, 4 m.g. water filtration plant addn., watermain extens., from Rust Eng. Co., Exchange Bldg., Birmingham, **$413,173.** CD 4/20—ENR 5/5.

Calif., Oakland — East Bay Municipal Utility Dist., 512 16 St., May 11, installing approx. 10,650 lin. ft. 54 in. welded steel watermains, Spec. LS-461, from McGuire & Hester, 796 66 Ave., **$233,774.**

●Mich., Detroit — Bd. Water Comrs., 506 Water Bldg. 735 Randolph St., Zone 26, May 11, 5,851 lin. ft. 10 ft. tunnel, Pennsylvania Ave. to Gratiot Ave., 700 ft. north-east on Gratiot Ave., Contr. DWS 27, Northeast Tunnel, Contr. Sect. 1, from Gargaro Co., 40 E. Seven Mile Rd., Detroit. **$1,471,000.** CD 4/14—ENR 4/28.

†Texas — U. S. Eng., 606 Santa Fee Bldg., Galveston, cancelled bids to have been opened June 7, fire and water sys., U. S. Maritime Commission Reserve Fleet Site, McFaddin Bend, Neches River, Serial No. Eng-41-243-49-290. CD 5/9.

Tex., Beaumont — City, City Hall, rejected bids Apr. 26, main pumping station imprvs., expansion. L. B. **$132,500.** CD 5/4 — ENR 5/12, under LB.

Tex., Pampa — City, City Hall, May 10 laying c.i. waterlines, 15,426 ft. 16 in., 5,600 ft. 14 in. concrete cylinder pipe; 1,000 ft. 10 in. cement asbestos pipe, 4 tons 16 in. c.i. fittings, etc., from Park Owen Constr. Co., Pampa, **$30,721,** furnishing c.i. pipe and fittings, from U. S. Cast Iron Pipe Co., Praetorian Bldg., Dallas, **$83,201**. CD 5/2.

Tex., Tyler — City, Bill Taylor, mgr., May 6, misc. work at raw water pump. station, Lake Tyler, using concrete piers from Vanderver & Christian, Tyler, **$185,536;** using timber piers, from J. C. Oliver, 2000 E. Erwin St., **$125,582.** CD 3/22—ENR 3/24.

Tex., Waco—City, May 12, 6 m. g. rein.-con. water storage tank, from Hoffman & Borders, Waco, **$163,785.** CD 4/15—ENR 5/5.

Wash., Seattle—Water Dist. 75, c/o General Eng. Co., engr., Central Bldg., May 10, 82,300 ft. 4-to -10-in. steel watermains, from P. S. Lord Mechanical Constr. Co., 4507 S. E. Milwaukie St., Portland, Ore., **$182,706.** CD 5/2.

B. C., Vancouver—City, 453 W. 12 Ave., Vancouver, May 10, 100,000 ft. 6 to 12 in. c. i. water pipe, from Evans, Coleman & Evans Ltd., north foot Columbia St., **$187,800.** CD 4/27—ENR 5/5.

Ont., Hamilton—City, J. F. Barry, clk., City Hall, May 12, high lift pump. station, Beach Waterworks Plant, from Olmsted & Parker Constr. Co. Ltd., 121 Shaw St., Approx. **$220,000.** CD 4/13—ENR 4/21.

CONTRACTS AWARDED

Ala., Decatur—City, water lines, Contr. B, to Zeigler Appliance & Supply Co., Greenville, **$128,151.** CD 4/20—ENR 5/5.

Fla., Winter Haven—City, water distr. sys., to J. D. Owens, Clearwater, **$124,338.** Bids 5/2. CD 5/12, under L.B.

La., Abbeville — City, City Hall, water filtration plant, to Refinite Sales Co., 1023 Harney St., Omaha, Neb., **$137,900.** Awarded 5/9.

●Mich., Detroit—Bd. Water Comrs., 735 Randolph St., Sect. 1, Northeast Tunnel, Contr. DWS 27, to Gargaro Co. Inc., 40 E. Seven Mile Rd., **$1,471,000.** Bids 5/11, awarded 5/17. CD 5/18—ENR 5/26, under LB.

O., North Royalton—Village, Abbey Rd., watermain extens., Bunker-Ridge and Royalton Rds., to Angelo Marra, Frederich Bldg., 2063 E. 4 St., Cleveland, **$148,995.** F. L. Woodruff, Public Square Bldg., Cleveland, engr.

SEWERS, WASTE DISPOSAL

BIDS ASKED

May 31

Mo., Sedalia—City, City Hall, sewage plant imprvs., bldgs., structures, North Plant and West Plant, Contrs. 6 and 7, Burns & McDonnell Eng. Co., Box 7088, Kansas City, Mo., engr. CD 12/1/47—ENR 12/11/47.

June 1

Okla., Henryetta — City, c/o City Clk., 13,000 lin. ft. sanitary sewer extens., appurtenances. $50,000. Plans deposit $15. L. M. McGoodwin, Fayetteville, Ark., engr. CD 3/12/48.

Okla., Okmulgee—City sanitary sewer extens. $60,000. Plans deposit $15. L. M. McGoodwin, Fayetteville, Ark. engr. CD 9/2/29—ENR 10/14.

June 2

Mass., Boston—Metropolitan Dist. Comn., 20 Somerset St., Boston, furnish, install sewage pump. equip., pump. station, East Boston, $50,000. Plans deposit $10. CD 5/12/44—ENR 6/1/44.

Ont., Shedden—Deputy Minister Hys., Toronto, storm sewers, for Province of Ontario, Toronto.

June 3

†New Mexico—U. S. Eng., P. O. Box 1538, Albuquerque, utilities addns., sewage disposal sys., Conchas Dam and Reservoir Proj., Serial No. Eng-29-005-49-66.

N. Y., Kew Gardens—President Queens Boro, 120-55 Queens Blvd., Zone 15, sanitary sewer, appurtenances, 87, 86, 144, 113 Aves., Creedmoor, and 227 Sts., 112 Rd.; combined sewer, appurtenances, Codwise Pl. and Kneeland Ave.; storm sewer, appurtenances, New York Blvd., 165 St. and Jamaica Ave. CD 8/25/44—ENR 9/7/44, under Jamaica.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $28,000; other public works $50,000; industrial buildings $68,000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.;

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	**Federal Government**
●	**Project of $1,000,000 or over.**
ENR	**Engineering News-Record**
CD	**Engineering News-Record Construction Daily**

June 6

Calif., San Diego—Bd. Supervs., San Diego Co., Civic Center Bldg., sewage treatment plant, collection sys. $200,000. Bids 4/25, withdrawn. Byre D. Phelps, 434 Union Bldg., engr. CD 4/14.

Calif., Sutter Creek—City, City Hall, sewer lines and sewage treatment plant. Approx. $50,000. Plans deposit $20. Whipple Eng. Co., 205 Hamilton Ave., Palo Alto, engr.

Tex., Alvarado—City, sanitary sewers, $50,000. Plans deposit $15. Joe J. Rady, 811, American Fidelity Bldg., Fort Worth, engr.

June 7

Ore., North Bend—City, City Hall, Schedule D, 7,265 lin. ft. 6-to 12-in. concrete pipe, of Sewer Imprvt. Proj. Plans deposit $20. Harvey & Watkins, Goldy Bldg., Medford, engrs. CD 11/13/46—ENR 11/28/46.

June 8

Calif., Los Angeles—City Bd. P. Wks., 153 City Hall, 12-to 45-in. concrete and rein.-con. pipe Central Ave. and 45 St. Storm Drain, Approx. $50,000. Lloyd Aldrich, city engr.

SOON LETS CONTRACT

Tex., Port Lavaca—Calhoun Development Co., Port Lavaca, soon lets contract concrete sanitary sewers to depth 12 ft. $60,000. Wyatt C. Hedrick, 5201 Fannin St., Houston, engr.

Tex., San Antonio—E. J. Burke & Sons, Inc., 4220 S. Zarzamora St., soon lets contract addnl. sanitary sewerage sys. N. New Braunfels Ave. between Austin Hy. and WOW Hospital. $70,600. D. W. Van Der Heck, 4220 S. Zarzamora St., consult. engr. W. E. Simpson Co., Milam Bldg., engr.

LOW BIDDERS

Calif., Walnut Creek—Central Conta Costa Sanitary Dist., 1822 Mt. Diablo Blvd., May 12, sewers in Local Imprvt. Dist. 4, from P. & J. Artukovich, 13,305 S. San Pedro St., Los Angeles, **$343,060.** CD 5/2.

Ill., Chicago—Sanitary Dist. of Chicago, 910 S. Michigan St., May 5, Div. Cb (fans, circulating) West-Southwest Sewage Treatment Wks., Stickney, from Clarage Fan Co., 333 N. Michigan St., **$103,087.** CD 3/9/45—ENR 3/19/45.

Mass., Weymouth—Town, Sewer Dpt., Town Hall, East Weymouth, Apr. 18, sewers, Contr. 8, from C. Jiustino, Inc., 36 Uplant Ave., Dorchester, **(A) $145,823, (B) $114,518.** CD 4/7—ENR 4/14.

Minn., St. Louis Park—Village, J. Justad, clk., Village Hall, May 9, sanitary sewers 2I and 2J, from Phelps-Drake Co., 1415 8 St. S. E., Minneapolis, 2I **$203,249,** alt. **$33,202;** 2J **$195,770,** alt. **$28,545.** CD 4/27.

●N. J., Hackensack—Bergen Co., Hackensack River Sanitary Sewer Dist. Auth., Bergen Co. Administrative Bldg., May 6, Overpeck Valley Joint Sewage Works, Contr. 1, from Progressive Builders, Inc., 315 Market St., Camden, **$3,819,000.** Contr. 15, from J. Rich Steers Co., 17 Battery Pl., New York 4, N. Y., **$958,810.** CD 4/7—ENR 4/28.

●N. Y., Mineola—Bd. Supervs. Nassau Co., Old Courthouse, Franklin Ave., May 17, sewage treatment plant at Bay Park from Hendrickson Bros., Inc., 63 N. Central Ave., Valley Stream, **$6,206,805.** CD 3/30—ENR 4/7.

●O., Cleveland—City, City Hall, E. 6 and Lakeside St., May 12, storm sewer, brick, from National Constr. Co., 23500 Lakeland Ave., Euclid, **$931,816;** concrete, from Curro Constr. Co., Union Comm. Bldg., **$933,939.** CD 4/29—ENR 5/5.

Pa., Marple Twp. (Broomall P. O.)—Marple Twp. Com., W. Chester Pike and Sproul Rd. sanitary sewer, various locations from Louis Mariani, 801 Lorraine Ave., Ardmore, **$104,662.** CD 4/27.

R. I., Providence—City, City Hall, May 2, sewers, various streets, from Fanning & Doorley Constr Co. Inc., 111 Westminster St., **$128,710.**

Tex., Beaumont—City, City Hall, May 10, storm sewers, city limits to Hy. 124 from East Texas Constr. Co., 165, 4 St., **$114,737.** Clyde Black, city engr. CD 6/26/47—ENR 7/10/47.

CONTRACTS AWARDED

Calif., El Cerrito—Stege Sanitary Dist., Manila and San Pablo Ave., sanitary sewers in Assessment Dist. 7, Arlington Estates, to McGuire & Hester, 796 66 Ave., Oakland, **$153,832.** Bids 5/10, Ross L. Calfee, 322 Arlington Ave., Berkeley, engr.

Mich., Lansing — City, City Hall, garbage treatment plant, sewage plant, to Darin & Armstrong, 2041 Fenkel St., Detroit, **$575,000.** Bids 3/21. CD 4/14—ENR 4/21, under LB.

Pa., Pittsburgh—City, City County Bldg., sewers North Ave., to Mannella & Co., 7003 Chaucer St., **$190,199.** Est. $200,000. CD 11/11/43—ENR 11/18/43.

R. I., Providence—City, D. E. Whelan, clk., City Hall, 4 story, bsmnt, 48x50 ft., brick, steel sludge incinerator, house boilers and oil pumps, ash hopper, Bldg. Div. 11, to Ayers-Hagan, Inc., 5 Westminster St., **$379,000.** Bids 4/18. CD 4/5—ENR 4/7.

Tex., San Antonio—City, Jack White, mayor, City Hall, storm sewers, throughout city, **$275,000;** sanitary sewers, mostly reconditioning and replacements, **$300,000,** Purchase and Hire.

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A. Thomas, city engr. CD 12/15/47 — ENR 12/25/47.

Ont., Islington—Etobicoke Twp., S Eckersley, clk., 4946 Dundas St., sewage disposal plant, to Foundation Co. of Ontario, Ltd., 1220 Bay St., Toronto. Approx. **$272,000.** CD 5/9—5/12.

Ont., Mimico—Etobicoke, Twp. 4946 Dundas St., Islington, sewage disposal plant, Mimico Creek, to Foundation Co. of Ontario Ltd., 1220 Bay St., Toronto, **$272,000.** F. McArthur, 4946 Dundas St., Islington, engr. CD 11/5/43—ENR 11/11/43.

BRIDGES

BIDS ASKED

June 6

N. Y., New York—Dpt. P. Wks., Municipal Bldg., Zone 7, east abutment approach ramps and superstructure for new south unit of new Unionport Bridge over Westchester Creek at Bruckner Blvd., Bronx Boro. Plans deposit $30. CD 11/15/44—ENR 11/30/44.

June 7

†Washington—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., structural steel for railroad bridge at East Low canal, Rocky Coulee wasteway, Station 139 plus 81.2. L. N. McClellan, c/o owner, ch. engr.

LOW BIDDERS

Kentucky—State Hy. Dpt., Frankfort, May 13, bridge and bit. surf. class I 0.361 mi. approaches, over Russell Creek at Columbia, Columbia-Campbellsville Rd., F 534 (1) SP 1-10, Adair Co., from G. H. Cheek Constr. Co., McClure Bldg., Frankfort, **$110,492;** bridge, approaches acros Beaver Creek, Martin-Burck Rd., RS 36-S36, Floyd Co., from R. R. Dawson Bridge Co., Bloomfield, **$73,848.** CD 4/27—ENR 5/5.

†Montana—P. Rds. Admin., 342 P. O. Bldg., Missoula, rejected bids May 12, steel, concrete bridge across Gallatin River, West Gallatin Forest Hy. Sys., Gallatin Co., L. B. **$166,336.** CD 5/18, under LB.

Vermont—State Hy. Dpt., Montpelier, May 13, 158 ft. steel W. F. beam bridge with concrete approaches, Springfield-Vermont, Windsor Co., from O. W. Miller Co., Inc., 200 North St., Ludlow, Mass., **$127,761.**

CONTRACTS AWARDED

Georgia—State Hy. Dpt., Atlanta, bridge at Etowah River on Rome Cartersville Rd., Bartow Co., to H. G. Smith, Fitzgerald, **$129,000*****grading, paving 3.158 mi. and 3 bridges and one overhead bridge on Fayetteville-Senoia Rd., Fayette and Coweta Counties, Contr. 1, to Carlton Contg. Co., Inc., Albany, **$144,598*****Contr. 2, same project, to Scott Constr. Co., Thomasville, **$108,785***** bridge, approaches on Augusta-Louisville Rd., Richmond Co., to Harry Brown, Milledgeville, **$58,780.** Grand total $441,163. Bids 4/29. CD 4/4—ENR 4/7.

●Pennsylvania—State Hy. Dpt., Harrisburg, superstructure three span cantilever truss bridge and 54 plate girder spans 12,661 ft. L. R. 67023 (3C) 67053 (3C), T. R. 191, Penrose Avenue Bridge, Philadelphia Co., to Bethlehem Steel Co., E. 3 St., Bethlehem, **$6,293,747.** Bids 4/29, awarded 5/16. CD 5/3—ENR 5/5, under LB.

Texas—State Hy. Dpt., Austin, Trinity River Bridge, approaches, Hy. US 75, UI-932 (13), Dallas Co., to M. E. Worrell and Worrell & Watkins, Junction, **$636,912.** Bids 4/26, awarded 5/3. CD 4/29—ENR 5/5, under LB.

STREETS AND ROADS

BIDS ASKED

May 31

N. Y., Brooklyn—President Brooklyn Boro, Boro Hall, Zone 2, 6 in. c. conc.—asph. repairing Atlantic Ave. from 5 to Washington Aves., Washington Ave. from Atlantic Ave. to Sterling Pl.; Flushing Ave. from Marcy Ave. to Broadway; Franklin Ave. from Flushing to Atlantic Aves.; Graham Ave. from Driggs Ave. to Grand St. Nassau Ave. from Manhattan Ave. to Apollo St.; 5 Ave. from Bay Ridge Ave. to 86 St.; Lewis Ave. from Myrtle to DeKalb Aves.; grading, curbing, flagging, asph. paving E. 48 St. from Lenox Rd. to Linden Blvd.; repairing where and when directed sheet asph. pavements roadways of various streets, in sect. bounded by East River, line between Brooklyn and Queens Boros, Pitkin Ave., Eastern Parkway, Flatbush Ave. and Fulton St.; in sect. bounded by Fulton St., Flatbush Ave., Parkside Ave., Ocean Parkway, Atlantic Ocean, W. 37 St., Gravesend Bay, the Narrows, Upper Bay and the East River; in sect. bounded by Eastern Parkway, Pitkin Ave., line between Brooklyn and Queens Boros., Atlantic Ocean, Ocean Parkway, Parkside and Flatbush Aves.

June 1

†Va., Little Creek—Pub. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Zone 11, resurf. roads at Naval Amphibious Base, Spec. 22635. Plans deposit $10.

June 6

Calif., Redding — Shasta Co., Hall of Records, plant mix surf, apply seal coat 3.698 mi. County Hy. 5-A, between State Hy. U. S. 299 at Towerhouse and about ½ mi. north of French Gulch, E. B. Breuning, 1835 Placer St., engr.

Tex., University Park—City, 3800 University St., Dallas, asph. street paving, $75,000. Jack B. Kirvin, 3009 Milton St., Dallas, engr.

N. B., Cape Tormentine—W. E. Robinson, c/o Canadian National Rys., B. Wheelwright, ch. engr., 360 McGill St., Montreal, Que., paving. Plans deposit $25.

June 8

Minn., Willmar — Kandiyohi Co., J. W. Haines, aud., Willmar, grading 3.2 mi. between 3.9 mi. north of T. H. 7 and 0.7 mi. north of T. H. 7 at Lake Lillian, S. P. 34-505-04 (SAR 8), Minn. Proj. S 139 (3); grading 7.1 mi. between SAR 5 and T. H. 17 at New London, S. P. 34-528-01 and S. P. 34-527-01 (SAR 4), Minn. Proj. S 415 (1). E. S. Ward, co. hy. engr.

About June 9

†Ohio—U. S. Eng., Madison Ave. and 8 St. W, Huntington 18, W Va.,

Delaware Co.—constructing Lot E, Horseshoe Rd., Relocation, Troy and Marlboro Twps., from point on Horseshoe Rd. approx. 0.7 mi. southeast of intersection of said road and Sherwood Rd., exten. in northerly direction for approx. 1.42 mi. Lavender Bridge-Ashley Radnor Rd.

Marion Co.—Lot A, St. James Rd. Relocation, Waldo Twp., from intersection of St. James Rd. and Rengert Rd., southwesterly for approx. 0.29 mi.

Lot B, Waldo-Fulton Rd. Reconstruction, Waldo Twp., from east end of Waldo-Fulton Rd. Bridge over Olentangy River, easterly approx. 0.13 mi.

Lot C, Prospect-Mt. Vernon Rd. Relocation, Waldo Twp., from point on Prospect-Mt. Vernon Rd. approx. 0.9 mi. east of intersection of said road and State Route 98, northerly approx. 0.51 mi. to Waldo-Fulton Rd.

Morrow Co.—Lot D, Prospect-Mt. Vernon Rd. Reconstruction, Westfield Twp., from point on Prospect-Mt. Vernon Rd. approx. 0.2 mi. east of Marion-Morrow County line, easterly approx. 0.14 mi. all foregoing Delaware Reservoir Proj. Olentangy River. Plans deposit $10.

June 9

Minn., Marshall — Lyon Co., G. O. Carlson, Marshall, grading 4 mi. between SAR 5 at Amirst and SAR 4, SP 42-508-02 SAR2, Minn., Proj. S 32 (3); grading 6.7 mi. S. P. 42-501-05 (SAR 9), Minn., Proj. S 232 (3), $50,000. Plans deposit 90c and $1.25. H. Bussard, co. hy. engr.

†Ohio—U. S. Eng., Madison Ave. and 8 St., W., Huntington, 18, W. Va., constructing 5 county and twp. roads, Delaware Reservoir Proj., Olentangy River, Serial No. Eng-46-022-49-144. CD 5/16—ENR 5/19.

July 1

Ia., West Union—Fayette Co., West Union, grade, bridge, surf. 17 mi. local county roads, $187,600. B. B. Hanson, West Union, engr., and A. D. Finch, co. engr.

December 1

Ia., West Union—Fayette Co., West Union, grade, surf. 4 mi. local county roads, bridge, Fayette-Bremer Co. $57,000. B. B. Hanson, West Union, engr. A. D. Finch co. engr.

Bids Asked

Tex., Houston — Bert Wheeler & Assocs., 8280 Main St., street construction, paving south of 9200 Blk S. Main St. $110,000.

SOON LETS CONTRACT

Tex., Port Lavaca — Calhoun Development Co., Port Lavaca, soon lets contract 7,700 lin. ft. 8 in. concrete and 300 ft. 10 in. rein.-con. paving, concrete curbs and gutters, $75,000. Wyatt C. Hedrick, 5201 Fannin St., Houston, engr.

Tex., San Antonio—E. J. Burke & Sons, Inc., 4220 S. Zarzamora St., soon lets contract addnl. street constr. and asph. paving N. New Braunfels Ave. between Austin Hy. and WOW Hospital. $90,000. D. W. Van Der Heck, 4220 S. Zarzamora St., consult. engr. W. E. Simpson Co., Milam Bldg., engr.

LOW BIDDERS

●California — State Div. Hys., Sacramento, May 11, bit. surf. 19.7 mi. shoulders plant mix surf. portions between 0.3 mi. south of Willows and Tehama Co. line, Glenn Co., from W. C. Railing, 27 Lowell St., Redwood City, **$69,772*****road mix on cement stablilized imported base material surf. and apply seal coat 1.2 mi. between Maple Creek and 1.2 mi. easterly, Mendocino Co., from A. R. McEwen, Box 127, Williams, **$111,044*****place selected material 8.1 mi. between Toms Creek and Cedarville, Modoc Co., from R. B. Guerin & Co., Box 107, South San Francisco, **$614,170***** place imported borrow over existing roadbed plant mix on stabilized imported base material surf. 4 mi. between San Ardo and King City, Monterey Co., from Fredericksen & Kasler, 212 13 St., Sacramento, **$174,386***** plant mix surf. 4.8 mi. various locations between Cloverdale and Healdsburg, Sonoma Co., from A. G. Raisch, 2048 Market St., San Francisco, **$152,430.** CD 4/20—ENR 4/28.

Colorado — State Hy. Dpt., Denver, May 11, grading, structures, overpass and bridge 1.933 mi. beginning at point approx. 1 mi. south of Larkspur and exten. 1.9 mi. north of State Hy. 1, Douglass Co., from Henry Shore, Littleton, **$281,424,** est. $363,987; grading, surf., structures, 6.15 mi. State Hy. 64,

(Continued on page 140)

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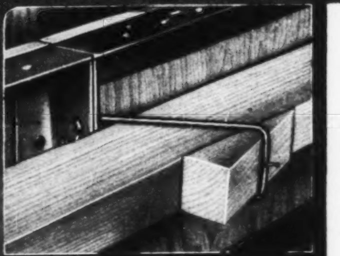

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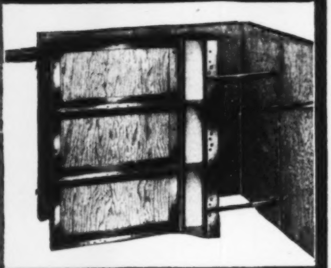

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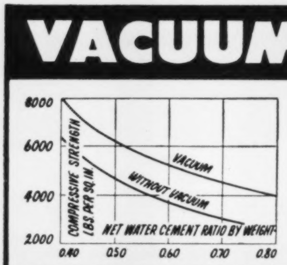

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(Continued from page 138)

between Rangeley and Meeker Colo. Proj. S-01-44 (3), Rio Blanco Co., from Blanchard Brothers, 56 and Holly Sts., Denver, **$213,444,** est. $239,587. CD 5/2—ENR 5/5.

Colorado—State Hy. Dpt., Denver, stabilizing and oil processing 9.239 mi. State Hy. 127, between Cowdrey and Wyoming State line, Proj. S-0105 (1), Jackson Co., from Read Constr. Co., Cheyenne, Wyo., **$107,893.** Est $159,123. CD 5/2—ENR 5/5.

●**Kentucky**—State Hy. Dpt., Frankfort, May 13, traffic bound surf. 8.513 mi. Merricks Store-Bell Mines Rd., S 154 (1) SP 28-246, Crittenden Co., from Mulligan Bros. Ind., Greenville, **$136,853*****bit. macad. Class D. 1.085 mi. F 234 (8) SP 35 250 81-175, Fleming and Mason Counties, from Gorman Constr. Co Inc., Flemingsburg, **$58,505*****high type surf. 0.838 mi. Shelbyville-New Castle Carrollton Rd., F 527 (2), SP 52-187, 52-7 Henry Co., from Kelly Contg. Co., Fincastle Bldg., Louisville, **$127,202** ***bit. surf. Class C-1 and A 2 seal 9.047 mi. Russellville-Morgantown Rd., S 251 (3) SP 71-40, Logan Co., and bit. surf. class I Mount Vernon-Berea Rd., 6 226 mi. FI 88 (6), SP 102 17 Rockcastle Co., from Geoghegan & Mathis, Bardstown, **$101,955** and **$329,696** respectively ***recon. and traffic bound surf. 6.017 mi. High Grove-Waterford Rd. S 176 (1) SP 108-207, Spencer Co., from Henderson Hite Constr. Co., Bardstown. **$73,515*****bit. surf. Class C-1 and A-2 seal 19.298 mi. SP MP Group 17 (1949), Trigg and Caldwell Counties, from McDade & McDade, Fulton, **$112,603*****bit. surf. Class F, 11.319 mi. SP Group 19 (1949), Pike Co., from Gay Coleman Constr. Co., 113 Cheapside St., Lexington, **$87,090*****bit. surf. Class C-1 and A-2 seal 15.22 mi. SP Group 20 (1949), Union Co., from Ellis, Kelly & Co., Owensboro, **$88,185*****bit. surf. Class I 15.143 mi. SP Group 23 (1949), Union Co., from H. K. Williams, 4141 Park Blvd., Louisville, **$95,802** ***bit. surf. Class F and rock asph. seal 11.249 mi. SP Group 24 (1949), Butler Co., from J. W. Willard, Bowling Green, **$77,549** ***bit. surf Class C-1 13.681 mi SP Group 25 (1949), Warren Co., and traffic bound limestone 9.37 mi. Alton Station-Hampton School Rd., McBrayer Fox Creek Rd., RS 3-211 and 3-231, Anderson Co., from R. B. Tyler Co., 1446 Levering St., Louisville, **$68,834** and **$81,175** respectively***bit. surf. Class C-1 and rock asph. seal 17.291 mi. SP Group 26 (1949), Logan and Simpson Counties, from Robert M. Robinson, Owensboro, **$114,962*****bit. surf. Class C-1, and A-2 seal 10.278 mile SP Group 27 (1949), Bullitt, Hardin and Larue Counties, and bit surf. class F 19.754 mi. SP Group 28 (1949), Marion and Taylor Counties, from Carey Constr. Co., 613 Citizens Bank Bldg., **$62,434** and **$89,936** respectively***bit. surf. Class F 21.221 SP Group 30 (1949), Barren-Metcalfe Counties, from L. P. Cavett Co., Lockland, O., **$108,839*****bit. surf. Class F 19.969 mi. SP Group 32 (1949), Anderson and Washington Counties, from Breslin Constr. Co Inc., 1801 S. Brook St., Louisville, **$109,239** ***bit. surf. Class C-1 and A-2 seal 47,314 mi. SP Group 33 (1949), Boone, Campbell, Carroll, Gallatin, Grant, Pendleton and Trimble Counties, from L. E. Bergin, Covington, **$119,050*****bit. surf. Class C-1 and rock asph. 15.306 mi. SP Group 35 (1949), Shelby and Henry Counties, from J. Sneed Yager, 315 High St., Frankford, **$88,199*****bit. surf. Class I 10.679 mi. SP Group 36 (1949), Grant Co., from Kentucky Road Oiling Co., Frankfort, **$71,705** ***bit. surf. Class I 15.593 mi. SP Group 37 (1949) Scott Co., from The Byrnes Conway Co., 19 Bank St. B., Cincinnati, O., **$152,961** ***traffic bound limestone 3.743 mi. Keck Bays Rd., RS 13-407, Breathitt Co., from Licking River Limestone Co., West Liberty, **$62,495*****traffic bound limestone 9.495 mi. Logansport-Reed Ferry Rd., Monford, Ky 105, Morgantown-Woodburt Rd., Casey-Oak Ridge Rd., RS 16-256, 16-496 and RS 16-476, Butler Co., from W. F. Robinson & Sons., Owensboro, **$96,476*****traffic bound limestone 4.461 mi. RS-32-229 and 32-249, Elliott Co., from Davis & Shelton Constr. Co., Sandy Hook, **$84,017** ***local bank or creek grav. 6.24 mi. RS 39-133 and 39-153 Gallatin Co., from I. H. Hardin, Bedford, **$59,287*****traffic bound limestone 9.56 mi. Gum Springs Rd. and Eve-Hudgins Rd., RS 44-176 and 44-216, Green Co., from Thompson & Ogden, Edmonton, **$55,588*****traffic bound limestone Cynthiana-Stonewall Rd., 6.739 mi. RS 49-152 Harrison Co., from C. D. Juett, Winchester, **$56,206*****traffic bound limestone 12.5 mi. Arvel-Congleton Rd., RS 65-89, Lee Co and local bank or creek grav. 5.119k mi. Wooten-Cutshin-Yeaddis Rd., RS 66-292 Leslie Co., from G. H. Cheek Constr. Co. McClure Bldg., Frankfort, **$110,220** and **$148,536** respectively. Received no bids May 13, traffic bound limestone 3.451 mi. RS 32-229, Elliott Co. CD 4/27—ENR 5/5.

Maryland — State Hy. Dpt., Baltimore, May 10, b. conc. surf., resurf. Sect. B, combination curb, gutter, storm water sewers appurtenant connections, grading, drainage, b. conc. surf. 0.986 mi. Frederick Rd., Contr. B. 582-415, Baltimore Co., from Harry T. Campbell Sons Corp., Towson, **$241,911.** CD 4/27—ENR 5/5; curve modification, resurf., wid'n. 1.144 mi. State Rt. 32, Frederick Co., from M. J. Grove Lime Co., Lime Kiln, **$63,960.** CD 5/4.

Md., Baltimore — Mayor & City Council, City Hall, sheet asph. resurf. streets, Contr. 962, from The National Paving & Contg. Co., 4200 Menlo Dr., **$128,114.** CD 4/19—ENR 4/21.

Md., Baltimore — Mayor & City Council, City Hall, May 11, sheet asph. resurf. streets, Contr. 978, from The American Paving &

Contg. Co., 2575 Loch Raven Blvd. **$125,008*****sheet asph. resurf. Contr. 977, from Potts & Callahan Paving Co., Inc., 2801 Falls Rd., **$152,537*****c. conc. Contr. 968 and 182, from Paramount Constr. Co. Inc., 3700 Gough St., **$88,615** and **$89,262** respectively***c. conc. Contr. 973, from Trinity Bldg. & Constr. Co., 4420 E. Edger St., **$87,336*****c. conc. Contr. 972, from Carozza-Hamill & Co., 10 W. 25 St., **$70,958.** CD 5/3—ENR 5/5.

North Carolina—State Hy. & P. Wks. Comn., Raleigh, May 17, c. conc. 6.5 mi. U. S. 74 from 7 St. approx. 100 ft. west of intersections with Park Terrace in Charlotte, east along or near streets and avenues across S. A. L. R. R. toward Monroe and connection with N. C. Route 27, Proj. 6558, Mecklenburg Co., from Rea Constr. Co., Box 2015, Charlotte, **$793,294.** Est. $400,000-$500-000. CD 5/6—ENR 5/12.

Pennsylvania—State Hy. Dpt., Harrisburg, rejected bids May 6, bit. surf. 21,632 ft. L. R. 181 (4), T. R. U. S. 31, from Ruffsdale west beyond Mendon, Westmoreland Co., L. B. **$245,665.** Will re-advertise. CD 5/11—ENR 5/19, under LB.

Pennsylvania—State Hy. Dpt., Harrisburg, May 13, bit. surf. 23,577 ft. L. R. 88 (6R); 91 (2R); 92 (2R); 205 (1R); 61036 (1R). T. R. U. S. 62, U. S. 6 and 66, Warren, Venango and Forest Counties, from Mayer Bros. Constr. Co., 1225 W. 18 St., Erie, **$58,377*****bit. surf. 3,407 ft. L. R. 184 (10), T. R. 29, Luzerne Co., from C. F. Goeringer Constr. Co., Inc., Wilkes-Barre, **$62,932*****bit. surf. 45,096 ft. L. R. 73 (R-8); 10051 (R-1); 10066 (R-1); T. R. 78; 8 and 258. Slippery Rock Boro and East and south of Boro, Butler Co., from Kelley & Meyer Co., Dollar Bank Bldg., Youngstown, O., **$137,206*****bit. surf. 4,473 ft. L. R. 285 (7); 285 Spur (3). T. R. U. S. 22, Berks Co., from Collins & Maxwell, Inc., Easton, **$52,157.** CD 4/28—ENR 5/5.

Tex., Griffing Park — Griffing Park, via Port Arthur, P. O., rejected bids May 10, b. conc. on 6 in. flexible paving, 50,705 lin. ft., concrete curbing and gutters, Griffing Park Area, L. B. **$191,000;** 50,000 lin. ft. Rosedale Dr., etc., L. B. **$166,201.** Will readvertise. CD 4/29.

Virginia—State Hy. Dpt., Richmond, May 17, stabil. base surf. tr. 6.82 mi. Routes 605, 613, 619 and 631, Pulaski Co., from R. G. Pope Constr. Co. and Adams & Tate Constr. Co., 2725 Roanoke Ave., Norwich, Roanoke, **$72,746*****c. conc. 3.34 mi. Route 29, north of Altavista, Campbell Co., from A. B. Burton Co., Lynchburg, **$210,905*****macad. bit. surf. tr. 0.99 mi. Route 11 east of Staunton, Augusta Co. from R. W. Moore & Co. and Echols Bros., Staunton, **$120,914*****waterbound macad. bit. surf. tr. 3.44 mi. Route 6 west of Richmond, Henrico Co., from Atlantic Bitulithic Co., 1400 Roseneath Rd., Richmond, **$145,741*****c. conc. 2.93 mi. Route 13 north and south of Oak Hall, Accomack Co., from Bero Eng. & Constr. Co., Hampton, **$329,692*****waterbound macad. surf. tr. and bridge 2.41 mi. Route 50 at West Virginia State Line, Frederick Co., from Wiley N. Jackson Co., R. F. D. 4, Roanoke, **$126,910.** CD 4/28—ENR 5/5 and CD 5/10—ENR 5/12.

Wisconsin—State Hy. Comn., Madison, May 17, c. conc. 1.507 mi. S. T. H. 24, West Allis Rd. C. T. Hy. Q. Proj. S 0831 (1), Milwaukee Co., from E. & C. Co., 819 E. Burleigh St., Milwaukee, **$170,867*****c. conc. 0.618 mi. Iowa and Bequette Sts., U. S. Hy. 151 and S. T. Hy. 23, Contr. 1, Proj. T 012-1 (7), Iowa Co., from Lehmann Constr. Co., Watertown, **$63,601** ***grading, draining 9.161 mi. West County Line-Loganville Rd., S. T. Hy. 154, Proj. S 0216 (5), Sauk Co., from A. B. Lynch Co., 740 N. Parkington Ave., Milwaukee, **$275,523** ***grading, draining, base course 6.686 mi. U. S. H. 51-East County Line Rd., S. T. Hy. 54, Contr. 1, Proj. S 033 (1), and grading, draining, bit. 3.995 mi. Manawa-Symco Rd. S. T. Hy. 22, Proj. S. 0482 (3), T 035 (4), and T 0482 (2), Waupaca Co., from Arthur J. Pagel, Almond, **$124,713** and **$175,407** respectively***bit: 4.673 mi. Osseo-Augusta Rd. S. T. Hy. 27, Proj. T 0149 (1), Eau Claire Co., from Badger Highways Co., Inc., Menasha, **$155,602*****base course surf. 4.41 mi. Platteville-Montfort Rd., S. T. Hy 80, Proj. T. 0510 (1) and T 0510 (2), Grant and Iowa Counties from Kalcheur & Gabelt, Inc., Cross Plains, **$99,024*****bit. 8.3 mi. State Line-S. T. H. 43 (East and West roadways) Rd. U. S. Hy. 41, Proj.T 02-1 (10) and T 02-1 (11), Kenosha Co., from White Constr. Co., 2543 W. Greves St., Milwaukee, **$801,774*****sheet asph. surf. 0.893 mi. West and East Capitol Dr., N. Port Washington to North Humboldt Aves., S. T. Hy 190, Contr. 1, Proj. U 06-1 (18), Milwaukee Co., from Schneider-Borchert Co. 606 W. Wisconsin St., Milwaukee, **$373,411*****bit. 9.018 mi. Bartel-C. T. H. "Q" Saukville-Fredonia and Thiensville-Cedarburg Rds., U. S. Hy. 141, and S. T. Hy. 57, Proj. T. 01-3 (2), T 02-3 (9), Ozaukee Co., from J. P. Humphries, Inc., 1226 W. Wisconsin St., Milwaukee, **$269,263** ***bit. 4.316 mi. North County Line-La Grange Rd., U. S. Hy. 12, Proj. T 04-1 (5), Walworth Co., from Rock Road Constr. Co., 5915 N. Rogers St., Chicago, Ill., **$165,940*****bit. 6.43 mi. S. T. H. 164- East County Line Rd. S. T. Hy. 190, Contr. 1, Proj. T 06-1 (6), Waukesha Co., from Payne & Dolan of Wisconsin, Inc., 735 N. Water St., Milwaukee, **$156,920*****plant mix, single aggregate type 6.588 mi. Athens-North County Line Rd., S. T. Hy. 97, Contr. 1, Proj. S 015 (5), Marathon Co., from Arthur Overgaard, Elroy, **$97,181.** CD 4/29—ENR 5/5.

Wyoming—State Hy. Comn., Cheyenne, rejected bids May 12, base course surf. bit. macad., etc. 0.937 mi. Newcastle streets, Proj. No. F-151 (3), Weston Co., L. B. **$157,354.** CD 5/4.

CONTRACTS AWARDED

Maine—State Hy. Dpt., Augusta, hy. constr., Herman, Kennebec Co., to Lane Constr. Corp., 37 Colony St., Meriden, Conn., **$65,463,** hy. constr. Benton and Clinton, Waldo Co., to Warren Bros. Roads Co. 38 Memorial Dr., Cambridge, **$57,018.** Bids 4/20, awarded 5/4. CD 4/11—ENR 4/14.

●**New York**—Bureau Contracts & Accounts, Albany, 0.62 mi. sect. Cross-Bronx Expressway from Olmstead Ave. to Westchester Creek, Bronx Co. to Tully & DiNapoli, Inc. and Gull Contr. Co., 89-31, 161 St., Flushing, **$3,994,757;** reconstruct 2.19 mi. Routes 6 and 12 near New Hartford, Oneida Co., to E. G. DeLia & Sons Constr. Corp., New Hartford, **$528,456.** Bids 3/1. CD 3/14—ENR 3/17, under LB.

N. Y., New York—Comr. Parks, at office Dpt. Parks, Arsenal Bldg., Central Park, 64 St. and 5 Ave., Zone 21, repaving Riverside Dr., W. 85 to W. 105 Sts., etc. to Mac Asphalt Constr. Corp., 33-15 Lawrence St., Flushing, **$119,745.** Bids 5/10 CD 5/2—ENR 5/5.

●**Texas**—State Hy. Comn., Austin, grading, structures 16.176 mi. Hy. U. S. 67, FI 431 (5), FI 800 (2) and (3), Hopkins and Hunt Counties to Wallace & Bowden, 5513 E. Grand Ave., Dallas, Zone 10, **$646,367.** Bids 4/26, CD 4/29—ENR 5/5, under LB***grading, structures Hy. 73, FI 1052 (17), Harris Co., to Russ Mitchell, Inc., P. O. Box 8056, 2302 Jefferson St., Houston, **$608,369.** Bids 3/23. CD 3/28—ENR 3/31, under LB***grading, structures, flexible base, base preservatives Hys. US 290, FM 20 and State 21, F 283 (2), Bastrop Co., to H. R. Henderson, P. O. Drawer 313, Marshall, **$528,387*****grading structures, paving US Hy. 87, Contr. 2, UI 1083 (5), Bexar Co., to M. B. Killian & Co., Inc. and Killian-House Co. P. O. Box 1981, San Antonio, **$1,066,631,** Bids 3/22, CD 3/25—ENR 3/31, under LB. Grand total $2,849,754.

Tex., Canton — Van Zandt Co., c/o Leon Cox, judge, Courthouse, all weather road constr., 5 mi. Precinct 1, **$60,000;** 10 mi. Precinct 3, **$115,000,** force account. CD 4/8—ENR 4/28.

Tex., Houston—Southcrest, Inc., Union Natl. Bank Bldg., Unit 2, construction and asph. paving streets in addnl. balance of 356 acre tract, to Vernon Miller, 2015 Mc Clendon St., Approx. **$100,000.** CD 5/4—ENR 5/12.

Tex., Livingston — Polk Co., Court House, road imprv. 9 mi., Leggett toward Hortense; Livingston toward Onalaskia; 10 mi. Moscow, force account, **$219,000.** CD. 5/29/47—ENR 6/12/47.

Tex., San Antonio—City, Jack White, mayor, City Hall, street repairing, reconditioning, surf., drainage various streets, Purchase and Hire, **$450,000.** A. Thomas, city engr.

Tex., San Antonio—W. K. Ewing Co., Alamo Natl. Bldg., asph. paved streets, off Austin Hy. north of Alamos Heights, to Colglazier & Hoff, Inc., 326 Seguin Rd., **$110,000.** R. Andricks, Milan Bldg., engr.

†**Virginia**—U. S. Eng., foot of Front St., Norfolk, access highway, right bank, Sects. A and B, Philpott Reservoir Proj., Smith River, Eng-44-110-49-174, to W. E. Graham & Sons, Cleveland, N. C., **$104,785.** Est. $159,539. CD 4/11—ENR 4/14.

Washington — State Hy. Dpt., Olympia, stockpiling ballast, crushed stone surf. crushed cover stone mineral aggreg. for non skid seal, and bit. penetration mash., Secondary Hys., SE 11-B and Primary State Hy. 3, Columbia, Garfield, Asotin, Benton, Franklin and Walla Walla Counties, to Curtis Gravel Co., P. O. Box 106, Spokane, **$110,602** ***clearing, draining, grading, landscaping 5.588 mi. Primary State Hy. 2, and Secondary State Hy. 1-R, Castle Rock to Toutle River, F. A. P. No. FI 001-1 (2), Cowlitz Co. to Fiorto Bros., 1100 Leary Way, Seattle, **$580,533*****c. conc. 3.277 mi. Primary State Hy. 5, Clover Creek to Roy Junction, Pierce Co., to N. Fiorto Co., 844 W. 48 St., Seattle, **$215,805** ***b. conc. 1.329 mi. Pioneer Way, F. A. S. No. S-540 (1), Pierce Co., to Woodworth & Co., Inc., 1200 E. D. St., Tacoma, **$57,419.** Grand total $964,359. Bids 5/13, awarded 5/13. CD 4/28—ENR 5/5.

Wyoming — State Hy. Comn., Cheyenne, grading, draining, 2 rein.-con. culverts LM, P. C. M. pipe culvert and misc. work 10.468 mi. Rawlins-Medicine Bow Rd., between Como Lake and Dana, Proj. No. FI 221 (4), U. S. 20, Carbon Co., to Forgey Constr. Co., Casper, **$484,866*****est. $571,976. conc. base course surf., bit. preservative tr., etc. 20.756 mi. Baggs-Creston Rd., Proj. No. S-67 (1), Carbon and Sweetwater Counties and base course surf., surf. tr. 43.588 mi. Lander-Farson Rd., Proj. No. S-66 (1), Fremont Co., to Northwestern Eng. Co., Box 576, Denver, Colo., **$88,998** est. **$97,272** and **$225,000** est. $288,836 respectively ***base course surf., asph. tr. grav. surf. by road mix method, stone chip seal coat, etc. 3.81 mi. Thermopolis-Hamilton Dome Rd. Proj. No. S-257 (4), Hot Springs Co., to Taggart Constr. Co., Cody, **$79,253** est. $66,264 base course surf., 2 treated timber bridges, etc. 4.053 mi. Bates Creek-Medicine Bow Rd., Proj. No. S-50 (3), Natroma Co., to Huntley Constr. Co., Rock Springs, **$74,855** est. $92,199. Grand total $952,972. Bids 5/12, awarded 5/13. CD 4/4.

Alberta—Province of Alberta, Edmonton, grading, 25 mi. Fort Saskatchewan to Chipman, to Doncaster Constr. Co. Ltd., Edmonton, **$107,300*****grading 20 mi. High River to Blackie, to F. W. Lamb, Calgary, **$65,425***** grading 16 mi. Pincher to Drywood River, to

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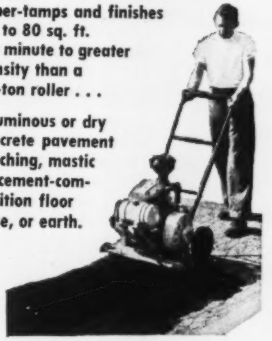

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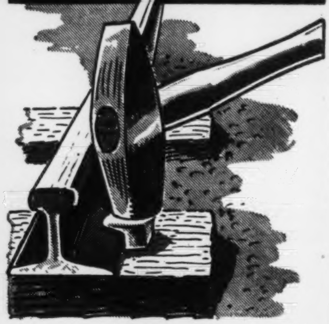

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F. R. Gibbs, Medicine Hat, **$118,351.** Grand total $291,076. CD 12/3/43—ENR 12/9/43.

British Columbia—Province of British Columbia, Parliament Bldg., Victoria, bit. surf. roads, Similkameen area, to Dawson, Wade & Co. Ltd., 775 Clark Dr., Vancouver, **$430,591.** Bids 4/12, awarded 5/6. CD 4/1—ENR 4/7.

EARTHWORK, WATERWAYS

BIDS ASKED

May 31

Md., Ocean City — Maryland State Rd. Comn., 108 E. Lexington St., Baltimore, 1 timber jetty across beach and into Atlantic Ocean at 18 St., Contr. Wo 310-1-115. Plans deposit $5.

Md., Towson—Comrs. Baltimore Co., Court House, deepening, wid'n., and relocation channel, Red House Run at Philadelphia Rd. and Chesaco Ave., Rosedale, Job Order 548 D, Sheet 1 and 2, incl. approx. 15,000 cu. yd. excav., 1,000 sq. yd. riprap, 20 acres clearing and grubbing, Wm. F. Neal, ch. engr.

June 1

†Illinois—U. S. Eng., 826 U. S. Court House & Custom House, St. Louis 1, Mo., excavation canal, construct levee, Mississippi River, Chain of Rocks Canal, Granite City.

†Illinois—U. S. Eng., 520 Merchandise Mart, Chicago, Zone 5 spillway, embankment, outlet works, for Farmdale Dam, Farm Creek, Tazewell Co., approx. 4 mi. east of East Peoria, Serial No. Eng. 11-032-49-98. CD 4/15—ENR 5/12.

†Louisiana—U. S. Eng., foot Prytania St., New Orleans, Zone 9, approx. 770,000 cu. yd. semi-compacted earthwork, Red River Back Water Levees, Concordia **Parish, Serial** No. Eng. 16-047-49-309.

●N. Y., Little Falls—Bureau Contracts & Accounts, Albany, canal spillway and misc. work, Herkimer Co. $1,200,000. Plans deposit $10.

†North Carolina—U. S. Eng., 308 Customhouse, Wilmington, survey and dredging ranges in Cape Fear River, at and below Wilmington, Serial No. Eng-31-075-49-58. CD 2/18/44—ENR 3/9/44.

†Ohio—U. S. Eng., Madison **Ave. and 8 St.** W., Huntington, W. Va., clearing to elevation 724, Burr Oak Reservoir Proj. East Branch of Sunday Creek Serial No. Eng.-46-022-49-142. CD 5/6.

June 2

†California—Bureau Reclamation, Dpt. Interior, Bldg., 1-A, Denver Federal Center, Denver, Colo., furnishing del. f.o.b. cars at shipping point or at Strathmore, 3 radial gates with rollers, pin bearings, wall plates, gate sills; 3 radial-gate hoists for Friant-Kern Canal Station 4773 plus 00, Central Valley Proj., Spec. 2653. L. N. McClellan, ch. engr.

†Illinois and Missouri—U. S. Eng., Clock Tower Bldg. Rock Island, Ill., upper approach dikes, Lock 17, left bank Mississippi River, Mercer Co., Ill., approx. 4 mi. upstream from New Boston, Ill.; upper approach dikes, Lock and Dam 22, right bank of Mississippi River, Ralls Co., Mo., approx. 1 mi. downstream from Saverton, Mo., Serial No. Eng. 11-117-49-65. CD 5/3—ENR 5/5.

June 3

†Nebraska—Bureau Reclamation, Dpt. Interior, Casper, Wyo., earthwork, concrete lateral lining and construct structures, Station 130 plus 18.6 to Station 172 plus 69.5, Lateral 90.4, soil and moisture conservation program, North Platte Proj., Spec. R7-61 (Region 7), North Platte Proj. Nebraska-Wyoming. Plans deposit $1.

About June 6

†Illinois—U. S. Eng., 826 U. S. Court House and Custom House, St. Louis, 1, Mo., 54 in. gravity drainage structure, Proj. Item 1-A (1), Jackson Co.

June 7

La., Plaquemine — Iberville Parish Police Jury, approx. 1,247,900 cu. yd. drainage projects. CD 12/2—ENR 12/23.

†Montana — Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Williston, N. D., one 50 ton transformer transfer car for Williston substation, Fort Peck Proj., Spec. 2658. L. N. McCellan, ch. engr.

June 8

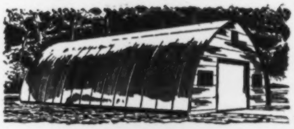
●†Texas—U. S. Eng., 606 Santa Fe Bldg., Galveston, 1,900 ft. long, 200 ft. high, earth and rein.-con. type Belton Dam and Reservoir Proj. Leon River, Inv. No. Eng-41-243-49-263. $12,500,000.

June 9

†Montana—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point, or f.o.b. cars Coram, metalwork, for elevator shafts, Hungry Horse Dam, Hungry Horse Proj., Spec. 2659. L. N. McClellan, ch. engr.

SOON LETS CONTRACT

Tex., San Antonio—E. J. Burke & Sons, Inc., 4220 S. Zarzamora St., soon lets contract addnl. grading, levelling, drainage, N. New Braunfels Ave. between Austin Hy. and WOW Hospital. $40,000. W. D. Van Der Heck, 4220



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LOW BIDDERS

†Alabama—U. S. Eng., P. O. Box 1169, Mobile, Zone 7, May 5, dredging 1,200,000 cu. yd. Mobile Harbor, Serial No. Eng-01-076-49-139, from Great Lakes Dredge & Dock Co., 124 Camp St., New Orleans, La., **$171,960.** Est. $150,000. CD 4/29—ENR 4/21.

†Arkansas—U. S. Eng., P. O. Box 60, Vicksburg, Miss., Apr. 27, clearing Narrows Reservoir, Pike Co., Serial No. Eng-22-052-49-145, Items 1 and 2, from Western-Burnett Constr. Co., P. O. Box 111, Denison, Tex., **$617,506,** est. $564,003 Item 3, from Volentine-Tucker & Terrell Contractors, 1524 Holden Ave., Newport, **$176,890** est. $168,428. CD 4/20.

†Arkansas—U. S. Eng., P. O. Box 60, Vicksburg, Miss., Apr. 26, mattress revetment construction, Arkansas River, Item R-65.9-L, Little Bayou Meto, Serial No. Eng-22-052-49-171, from W. P. McGeorge Jr., Box 995, Pine Bluff, **$127,975** est. $145,429. CD 4/20.

†California—U. S. Eng., 751 S. Figueroa St., Los Angeles, May 10, Los Angeles County Drainage Area, Sawtelle-Westwood System, Ballona Creek to Braddock Dr., Serial No. Eng-04-353-49-67, from Spencer Webb Co. & J. S. White, 4719 Melrose Ave., Los Angeles, **$144,992.** CD 4/13—ENR 4/21.

†Florida—U. S. Eng., P. O. Box 4970 Jacksonville, Apr. 29, maintenance dredging (shoal removal) 245,400 cu. yd. Turning Basin and Channel from Turning Basin to mouth of Miami River, Miami Harbor, Inv. No. Eng.-08-123-49-87, from The Arundel Corp., Pier 2, Pratt St., Baltimore, Md., **$108,663.** CD 4/14—ENR 4/21.

†Indiana—U. S. Eng., 830 W. Broadway, Louisville, Zone 3, Ky., May 10, grade raise for Levee Unit 8, White River, Wabash River Basin, Daviess Co., Serial No. Eng. 15-029-49-125, from Green Constr. Co., Oaktown, **$111,-117.** CD 4/8—ENR 5/5.

†Louisiana—U. S. Eng., foot Prytania St., New Orleans, Zone 9, May 10, approx. 850,000 cu. yd. semi-compacted earthwork, Grant and Rapides Parishes, Serial No. Eng. 16-047-49-286, from Jones & Buchanan, Alexandria, **$174,845.** CD 4/26—ENR 4/28.

†Missouri—U. S. Eng., Davidson Bldg., Kansas City, Mo., bids cancelled to have been opened May 13, emergency levee repairs, along Missouri River, Serial No. Eng. 23-028-49-213. CD 5/2—ENR 5/5.

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, repairing levees and protective works, Middle Rio Grande Conservancy Dist., Eng-29-005-49-94, from Miller & Smith, P. O. Box 183, **$313,620.** Est. $312,983.

†New York—U. S. Eng., 120 Wall St., New York, Zone 5, rejected bids Apr. 28, dredging all material except ledge rock for Long Island Intracoastal Waterway and Great South Bay. CD 4/20.

†North Dakota—U. S. Eng., Fort Lincoln, Box 300, Bismarck, May 10, levee on Heart River, near Mandan, Inv. No. Eng-32-015-49-79, from Tom Hellander, 1101 N. 5 St., Fargo, **$243,396.** CD 5/2—ENR 5/5.

†Texas—U. S. Eng., 606 Santa Fe Bldg., Galveston, May 12, dredging 2,000,000 cu. yd. material Port Aransas-Corpus Christi Waterway, Inv. No. Eng-41-243-49-267, from McWilliams Dredging Co., 860 St. Charles Ave., New Orleans, La., **$157,830.** Est. $150,-000. CD 4/19—ENR 4/21.

†Tex., Galveston—U. S. Eng., 606 Santa Fe Bldg., May 12, dredging 4,931,000 cu. yd. materials, Galveston Channel, Inv. No. Eng. 41-243-49-266, from Standard Dredging Corp., 80 Broad St., New York, N. Y., **$301,434.** CD 4/19—ENR 4/21.

†Washington—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., rejected bids rescinded, bids will be reconsidered, electric elevators for Grand Coulee Pumping Plant, Spec. 2543, Columbia Basin Proj. L. B. **$158,500.** CD 4/18—ENR 4/28, under LB.

CONTRACTS AWARDED

●†Kentucky—U. S. Eng., 303 U. S. Court House, Nashville, Tenn., clearing segments, Group 3, Wolf Creek Reservoir, Cumberland River, Serial No. Eng. 40-058-49-71, to Schutt Constr. Co. & Assoc., Genoa, Wis., Item 4 **$589,000,** est. $431,700; to Volunteer Clearing Co., Nashville, Tenn., Item 5, **$265,000,** est. $188,300. Bids 4/21. CD 5/4—ENR **4/12.** under LB.

AIRPORTS AND AIRBASES

BIDS ASKED

June 1

Conn., Hartford — AIRPORT HEADQUARTERS BLDG.—State, Raymond S. Thatcher, comptroller, State Capitol, brick airport headquarters bldg. addn., Brainard Airfield. CD 10/16/46—ENR 10/31/46.

On or About June 2

†Ala., Craig Air Force Base (P. O. Selma)—CRASH STATION—U. S. Eng., P. O. Box 1169, Mobile, 7, Ala., crash station. CD 10/22/48—ENR 10/28/48.

†N. M., Alamogordo—HOUSING—U. S. Eng., P. O. Box 1538, Albuquerque, family quarters, Holloman Air Force Base. (Holloman AFB A-91 (C), Serial No. Eng-29-005-49-90. CD 5/2.

†N. Y., Schenectady—HANGAR—U. S. Eng., 120 Wall St., New York, Zone 5, hangar. $500,-000.

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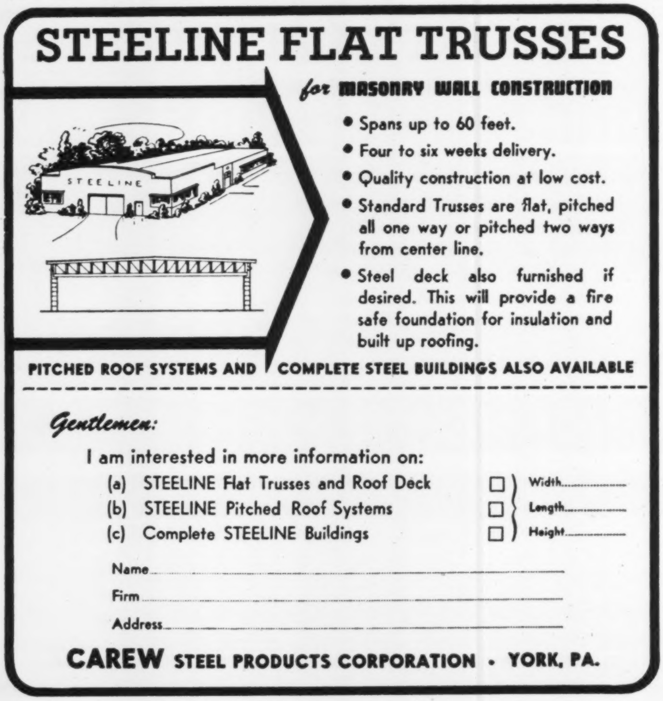
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†Tex., Lubbock — AIRPORT—Civil Aeronautics Admin., P. O. Box 1689, Fort Worth, instrument landing sys. for municipal airport, incl. steel frame bldgs., appurtenances, Proposal No. 4-49-481. $90,000. Plans deposit $5.

June 3

†Tex., Dallas—SEWERS—U. S. Eng., 606 Santa Fe Bldg., Galveston, 8- to 10-in. sewer force main replacements, at Hensley Air Force Base. $50,000.

June 5

†Mass., East Boston—LEAN-TO—U. S. Eng., Army Base, Boston, Zone 10, 2 story, 22x155 ft. lean-to, 1 story lean-to and 2 story 38x122 ft. lean-to, hangar addn., Logan Airport. Over $50,000. Plans deposits $10. CD 3/28—ENR 3/31.

Bids Asked

Pa., Sunbury—AIRPORT IMPRVS., etc.—Penn Valley Airport, c/o R. K. Brosius, Penn Valley Airport imprvs. and grading, $75,000 Michael Baker, Jr., Rochester, engr. CD 1/15/45—ENR 1/25/45.

Pa., Williamsport—AIRPORT—Williamsport Airport, c/o Edward Turner, Williamsport, Williamsport Airport imprvs., alterations. $50,000. Mark C. Krause, Williamsport, engr.

LOW BIDDERS

Colo., Grand Junction—AIR TERMINAL—City, City Hall, May 11 1 story, part bsmnt., 50x194 ft. air terminal, from Walker-Lybarger Constr. Co., Box 324, Grand Junction, **$117,045.** Est. $70,000. Smith, Hegner & Moore, 132 S. 4 St., engrs. and archts.

Miss., Greenville—AIRPORT IMPRVS.—City, City Hall, rejected bids May 10, airport administration bldg. CD 4/29.

●N. Y., Binghamton—AIRPORT—Bd. Supervs. Broome Co., Office Bldg., Apr. 18, paving and other constr. Broome County Airport, from Binghamton Constr. Co., Inc., 307 Marine Midland Bldg., **$1,234,786.** CD 3/17—ENR 3/24.

†O., Cleveland — LABORATORY — National Advisory Committee Aeronautics, Administration Bldg., 1 story L shaped, 55x223 ft. and 30x70 ft. concrete block high energy laboratory bldg., incl. laundry, from H. K. Ferguson Co., 1783 E. 11 St., **$309,750,** 1A **$5,002,** 1B **$2,200;** from Hunkin Conkey Constr. Co., 1740 E. 12 St., No. 2, **$193,262,** 2A, **$5,369.** Est. $500,000. H. K. Ferguson Co., 1783 E. 11 St., archt.

†O., Mansfield—AIRPORT—U. S. Eng., 830 W. Broadway, Louisville, Ky., May 12, Air National Guard Facilities, incl. aircraft parking apron, roads and utilities, from Friebel & Hartman, Inc., Shelby, **$194,534.** CD 4/8—ENR 5/5.

Tenn., Knoxville — AIRPORT — City, City Hall, May 9, McGhee Tyson Airport imprvs., from Harrison Constr. Co., Maryville, **$119,835.**

CONTRACTS AWARDED

●Ill., Chicago — AIRPORT IMPRVS.—City, Dpt. Purchases, Contracts & Supplies, City Hall, terminal bldg., hangars clearance, runways, utilities, sewers, water supply sys., grading, parking apron, Class VIII airport, 15 mi. northwest of Chicago, Chicago International Express Airport, to Arcole Mid West Corp., 3225 Main St., Skokie, Chicago, **$2,113,150.** Bids 3/9. CD 3/15—ENR 3/17, under L.B.

Okla., Bartlesville — AIRPORT BLDGS. — City, 38x120 ft. administration bldg., Contr. 1, to Robinson & Duckworth, Bighton Bldg., Coffeyville, Kan., **$82,690,** est. $90,000***91x147 ft. steel and masonry hangar, Contr. 5, to Walter Nashert Co., 16 N.E. 27 St., Oklahoma City, **$204,600,** est. $225,000***grading, paving, sodding, utility lines and disposal plant, Contr. 3, to Standard Paving Co., 2119 E. 11 St., Tulsa, **$94,977,** est. $100,000, at Bartlesville Airport. Grand total $382,267. Bids 4/25. CD 4/20.

Pa., Pittsburgh—PAVING, etc.—Comrs. Allegheny Co. Dpt. Aviation, County Office Bldg., drainage and paving entrance plaza to terminal bldg., Greater Pittsburgh Airport, to Klean Wise, Inc., Centennial and Locust Sts. **$289,915.** Est. $300,000. CD 1/15/45—ENR 1/25/45.

Tex., Grand Prairie — HANGAR — Chance-Vought Aircraft, c/o Earl Martin, Grand Prairie, hangar, to James Stewart & Co., Inc., Grand Prairie, **$225,000.** CD 4/26—ENR 4/28.

†Alaska—OUTSIDE UTILITIES—U. S. Eng (P. O. Box 492, c/o P.M., Seattle, Wash.) Anchorage, outside utilities, Eielson Air Force Base, Eng-95-507-49-13, to Selid Constr. Service, Fairbanks, **$596,858.** Bids 4/5. CD 4/11—ENR 4/14, under LB.

†Canal Zone — AIRPORT — U. S. Eng., Box 5043, Ancon, Canal Zone, imprv. drainage facilities, Albrook Air Force Base, Eng-96-505-49-18, to Isthmian Constructors, Inc., P. O. Box 2045, Curudu, **$252,489.** Est. $234,530.

AMERICANS ABROAD

India, Calcutta—Government of India, New Delhi, design, supply and engineering supervision, generating station for Damodar Valley multi-purpose project, to International General Electric Co. (India) Ltd., subsidiary International General Electric Co., 570 Lexington Ave., New York, N. Y., U. S. A., **$15,000,000.**

LATIN AMERICA

British Guiana, Georgetown—Government of British Guiana, Georgetown, receiving bids June 15, reconstructing 20 mi. roadway, Georgetown-to U. S. Air Force Base at Atkinson Field, reconstructing 51 mi. roadway New Amsterdam to Crabwood Creek, Dpt. P. Wks., Georgetown, engr.

Mexico, Temazcal—Mexican Govt., Sria. de R. H. Balderas, 94, Mexico, D. F., receiving bids June 7, Presidente Aleman irrigation dam. Plans deposit $65.

PUBLIC BUILDINGS

BIDS ASKED

May 30

Man., Fort Garry—Minister P. Wks., Province of Manitoba, Winnipeg, horse and cattle bldg. Plans deposit $25. Green & Assoc., 310 Time Bldg., Winnipeg, archts. CD 3/30/45—ENR 5/3/45.

May 31

Conn., Berlin — Bd. Educ., Berlin, high school. **$890,000.** Ernest F. Sibley, 7 S. Main St., West Hartford, archt. CD 1/16/48—ENR 2/5/48.

Ga., Valdosta—City, Valdosta, Patterson Street School, three wings, one 59x154 ft.; one 59x125 ft. and other 41x201 ft. Plans deposit $25. Lloyd Greer, 803 Oak St., archt.

†Ky., Middlesboro — Dpt. Army, National Guard Bureau, Bldg. T-29, Bowman Field, Louisville, motor vehicle storage bldg., for Kentucky National Guard. Plans deposit $5.

†Ky., Monticello—Dpt. Army, National Guard Bureau, Bldg. T-29, Bowman Field, Louisville, motor vehicle storage bldg., for Kentucky National Guard. Plans deposit $5.

†Ky., Ravenna—Dpt. Army, National Guard Bureau, Bldg. T-29, Bowman Field, Louisville, motor vehicle storage bldg. for Kentucky National Guard. Plans deposit $5.

†Ky., Russellville — Dpt. Army, National Guard Bureau, Bldg. T-9, Bowman Field, Louisville, motor vehicle storage bldg., for Kentucky National Guard. Plans deposit $5.

O., Akron—Bd. Educ., Hazel Fleek, clk., 70 N. Broadway, Thomastown School alterations, 1280 Triplett Blvd., Fairlawn School addn., Meadowcroft Dr. Milton E. Murphy, 70 N. Broadway, archt. CD 12/13/44—ENR 12/28/44.

O., Athens—Ohio Dpts. Bldg., G. B. Sowers, dir. P. Wks., Columbus, receiving hospital revised at Athens State Hospital. DeVoss & Donaldson, National Bank Bldg., Portsmouth, archts.

About June 1

Ind., New Albany—Bd. School Trustees, New Albany, 1 story, bsmnt.; brick, stone, rein.-con. high school. $300,000. Hawkins & Walker, 304 Elsby Bldg., archts. CD 11/20—ENR 12/12/46.

Ala., Fort Payne—DeKalb Co., Fort Payne, courthouse and jail, $375,000. Sherlock, Smith & Adams, 301 Washington St., Montgomery, archts. CD 1/7—ENR 2/3.

June 1

Calif., Sacramento—State Div. Architecture, P. Wks. Bldg., concrete fdns. for new 5 story, bsmnt. state capitol bldg. addn. Plans deposit $25. Anson Boyd, state archt. CD 10/11/43—ENR 10/14/43.

Conn., Danbury — State, Raymond S. Thatcher, comptroller, State Capitol, Hartford, brick, steel, concrete laboratory-science unit, State Teachers College. $900,000. Walter J. Campbell, 337 Main St., archt. CD 3/30—ENR 5/12.

Ind., Gary—U. S. Property & Disbursing Office, Indiana National Guard, Bldg. 115, Ft. Benjamin Harrison, brick, wood, steel motor vehicle storage bldg., in three sections, 70x190 ft., 70x232 ft. and 70x145 ft., Serial No. NG 12-064-49-1.

Ia., Traer—City, City Hall, light plant imprvs. $90,000. Plans deposit $25. E. L. Patera, Royal Union Bldg., Des Moines, Zone 9, engr. CD 4/4/46—ENR 6/13/46.

Mass., Northampton—City of Northampton Housing Auth., J. A. Watrous, chn., City Hall, 80 unit 2 story veterans housing; incl. seventeen 4 family units, two 6 family units, Hampshire Heights, Bridge Rd. and Jackson St. $850,000. Plans deposit $50. James A. Britton, 20 Federal St., Greenfield, archt. CD 3/18—ENR 3/31.

†Mich., Battle Creek—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Mich., Battle Creek—U. S. Eng., 520 Merchandise Mart, Chicago 54, Ill., rehabilitation certain areas Percy Jones General Hospital, Serial No. Eng. 11-032-49-96.

†Mich., Cadillac—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Mich., Dearborn—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Mich., Flint — Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Mich., Grand Rapids—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Mich., Jackson—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Mich., Kalamazoo — Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Mich., Lansing—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Mich., Muskegon—Ninth Naval Dist., Great Lakes, Ill., garage, at Naval Reserve Training Center.

†Mich., Pontiac—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Mich., Port Huron — Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Mich., Saginaw—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†N. J. Dover—U. S. Eng., 120 Wall St., New York, 5, N. Y., high explosive bldg. at Picatinny Arsenal. CD 11/20/46—ENR 12/21/46.

N. Y., Elmira—Bd. Educ., School Dist. 1, Elmira, Elementary and Junior High School addn. $626,266. Extended date. CD 4/21—ENR 4/28.

N. Y., Saratoga Springs—Bd. Trustees of Saratoga Springs Free Library, Inc., M. D. Hunt, pres., 590 Broadway, general contract and mechanical work for Saratoga Springs Free Library. Plans deposit $10.

O., Bowling Green—Wood County Hospital Assn., J. R. McDowell, pres., 104 N. Main St., Wood County Hospital. $750,000. Plans deposit $25. Lyman T. Strong, 607 Cook Tower, Lima, archt. CD 11/30—ENR 12/2.

†Washington — Bonneville Power Admin., 729 N. E. Oregon, Portland 8, Ore., Snohomish substation addns., Inv. 4616. Plans deposit $25.

Ont., Welland—J. M. Somerville, secy., c/o Dpt. P. Wks. Hunter Bldg., Ottawa, 2 story, 85x100 ft., concrete, brick, post office addns., alterations, King St. Approx. $250,000. G. Brault, c/o owner, engr. CD 4/9/45—ENR 5/3/45.

June 2

Conn., Norwich — City, Norwich Housing Auth., W. J. Barrett, chn., 225 Main St., 55 family units, incl. 17 five room houses, 8 four room duplex houses, 5 single homes, sidewalks, grading, sewers, streets. $550,000. Chandler & Palmer, 16 Franklin St., archts.

Ill., Chicago—Chicago Housing Auth., 343 S. Dearborn St., relocation Housing Site 5, Sacramento and Harrison, incl. 126 dwelling units. Pace Assoc., 53 W. Jackson St., archts. CD 12/17—ENR 1/20.

†N. J., Dover—U. S. Eng., 120 Wall St., New York 5, N. Y., single and double base mixing bldg. at Picatinny Arsenal.

†N. Y., St. Albans—Pub. Wks. Office, Third Naval Dist., Hudson Terminal Bldg., 50 Church St., New York, Zone 7, renovating hospital corps quarters, U. S. Naval Hospital, Spec. 21627. Plans deposit $50. CD 11/10/47—ENR 11/27/47.

N. C., Ruffin—Wentworth-Rockingham Co. Bd. Educ., Wentworth, school. Plans deposit $50. Lindsey M. Gudger, 52 Carter St., Asheville, archt.

Wis., Platteville—City, 1 story part bsmnt., steel, concrete, brick hospital, concrete fdn. $390,000. Plans deposit $20. J. G. Durant, Boscobel, archt. CD 2/27/48—ENR 3/18/48.

†Alaska, Fort Randall—U. S. Eng., (APO 942, c/o P. M., Seattle, Wash.) Anchorage, one family dwelling for Alaska Communication Sys., Bids 3/31 rejected. L. B. **$75,000.** CD 3/23.

Ont., Stratford—A. J. E. Smith, engr., c/o Central Mortgage & Housing Corp., 395 Fleet St. W., Toronto, 51 houses, Proj. 4/49. Approx. $357,000. CD 3/17—ENR 4/1.

June 3

Calif., San Bernardino—San Bernardino Co., Courthouse, 2 story, 53,000 sq. ft. rein.-con. tuberculosis ward county hospital addn. $871,000. J. D. Harnish, 212 E. B. St., Ontario, archt. H. S. Whittlesey, 525 N. Normandie Ave., Los Angeles, engr.

†Ill., Danville—Ninth Naval Dist., Great Lakes, garage at Naval Reserve Training Center.

†Ill., Decatur—Ninth Naval Dist., Great Lakes, garage at Naval Reserve Training Center.

†Ill., Moline — Ninth Naval Dist., Great Lakes, garage at Naval Reserve Training Center.

†Ill., Quincy — Ninth Naval Dist., Great Lakes, garage at Naval Reserve Training Center.

†Ill., Springfield—Ninth Naval Dist., Great Lakes, garage at Naval Reserve Training Center.

†Ind., Terre Haute—Ninth Naval Dist., Great Lakes., Ill., garage at Naval Reserve Training Center.

†Ia., Dubuque—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Ia., Waterloo—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Ky., Owensboro—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Minn., St. Paul—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Mo., Hannibal—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

New York—Bd. Transportation, 250 Hudson St., New York, Zone 13, general construction Brook Street Bus Garage, Brook St. west of Pike St., Richmond Boro.

N. Y., New York—New York City Housing Auth., 63 Park Row, Zone 7, street and yard imprvs. for Eastchester Houses, Proj. No.

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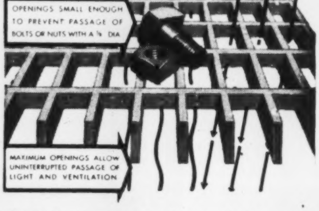
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NYC-5, in area bounded by Yeates, Burke, Bouck and Adee Aves., Bronx Boro. Plans deposit $25.

†N. D., Fargo—Ninth Naval Dist., Great Lakes, Ill., garage at Naval Reserve Training Center.

†Wash., Longview—Pub. Wks. Officer, 13 Naval Dist., 1611 W. Wheeler St., Seattle, Naval Reserve Training Center, three 40x100 ft. wings connected by 26x150 ft. structure with 39x71 ft. small-arms range, garage and storage bldg., timber pier and approach trestle, sheet-pile bulkhead, dredged mooring basin, etc. Spec. 22272, for Yards & Docks Annex, Navy Dpt., Arlington, Va. Plans deposit $10. CD 3/4—ENR 3/17.

Wash., Pullman—Washington State College, Pullman, modernizing, enlarging hospital. $210,000. Funk & Molander, Sun Life Assurance Bldg., Spokane, archts. CD 7/17/47—ENR 8/7/47.

About June 6

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, two unit substation, Sandia Base, Serial No. 291-49-100.

June 6

Kan., Wichita—Bd. Educ., Wichita, Horace Mann Intermediate School addn. $350,000. Lorentz Schmidt, McVay & Peddie, 1832 W. 2 St., archts., CD 2/18—ENR 3/17.

N. Y., New York—Port of New York Auth., 111 Eighth Ave., Zone 11, furnishing, installing pneumatic tube sys. in New York Union Motor Truck Terminal, Contr. NYT-8. Plans deposit $10. CD 8/25/44—ENR 9/7/44.

†Tenn., Oak Ridge—NEPA Div. Fairchild Engine & Airplane Corp., P.O. Box 415, altering bldgs., F-06, F-07, F-12, F-14 and F-17; addns., alterations to Bldgs. F-08, F-11, F-13, and F-30, at site of NEPA Proj. in S-50 area, Inv. No. 48-5. Plans deposit $25.

†Tex., Fort Bliss—U. S. Eng., P. O. Box 1538, Albuquerque, N. M., 48 single type family quarters. Serial No. Eng-29-005-49-82. Extended date. $450,000. CD 5/10.

Tex., Kilgore—City, Roy Laird, mayor, 50 bed city hospital. $550,000. Plans deposit $25 for general, **$15** for mechanical and equip. Mark Lemmon, 1210½ Main St., Dallas, archt. CD 8/12—ENR 9/2.

June 7

†Mississippi — U. S. Eng., P. O. Box 60, Vicksburg, change house and boat rental concession bldgs., Lower Lake, Sardis Dam, Serial No. Eng. 22-052-49-197.

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, AEC family housing, Stage IV, Sandia Base, Serial No. 291-49-94. CD 5/11—ENR 5/19.

Bids Asked

Pa., Muncy—Muncy Valley Hospital, c/o W. E. Turner, Muncy, 2 story; brick, concrete block hospital. $350,000. John E. Boodon & D. H. Grootenboer, Williamsport, archts. Irvin H. Geiger, 216 Locust St., Harrisburg, engr. CD 4/12/45—ENR 4/19/45.

LOW BIDDERS

Calif., Lawndale—Lawndale School Dist., 14609 Grevillea Ave., Apr. 28, Lawndale Elementary and Intermediate School, from Nesser, Johnson & Vedder, 4822 W. Jefferson St., Los Angeles, **$463,000.** H. L. Gogerty, 3123 W. 8 St., Los Angeles, archt.

●Calif., Stockton — Stockton Unified School Dist., 324 N. San Joaquin St., May 10, 2 story, 125,444 sq. ft. first floor and 39,238 sq. ft. 2nd floor concrete, steel with stucco front Franklin High School, from Barrett & Hilp, 918 Harrison St., San Francisco, **$2,398,652.** CD 3/28—ENR 3/31.

Calif., Torrance—Torrance Unified School Dist., Torrance, May 10, steel, stucco Seaside Elementary School, incl. 16 classrooms, cafe, kindergarten, from Harry Heinshberg, 4112 W. Jefferson Blvd., Los Angeles, **$402,970.** CD 4/19—ENR 4/21.

Colo., Longmont—School Dist. 17, Longmont, May 9, Central Elementary School addn., and Columbine Elementary School addn., from Mead & Mount Constr. Co., 422 Denver National Bldg., Denver, **$439,000.** CD 4/26—ENR 4/28.

Fla., Gainesville—State Bd. Control, c/o Guy C. Fulton, archt., 204 Peabody Hall, May 13, engineering bldg., Proj. 2, University of Florida, from J. A. Jones Constr. Co., 209 W. 4 St., Charlotte, N. C., **$438,800.** CD 5/3—ENR 5/5.

Ill., Carthage — Memorial Hospital Assn., Mrs. Mary F. Hartzell, pres., 416 S. Madison St., received no bids May 1, 1 story, brick, stone hospital. Approx. **$600,000.** CD 4/20.

Md., Baltimore—Mayor & City Council, City Hall, brick, rein.-con. steel Southern Health Dist. Bldg., from Leimbach & Williams, 30 W. Biddle St., **$404,430.** R. E. L. Williams, 410 Municipal Bldg., constr. engr. CD 4/13/48—ENR 4/29/48.

●Md., Bel Air—Harford Co., Bd. Educ., Bel Air, May 11, North Harford High School, Bush Corner, from The Davis Constr. Co., 320 W. 24 St., Baltimore, **$1,229,400.** CD 4/7—ENR 4/21.

●Mass., Fall River—City of Fall River Housing Auth., 151 Sunset Hill, May 11, 196 unit housing, South End Proj., Maple Gardens, Proj. 200-2, from E. Turgeon Constr. Co. Inc., 614 Turks Head Bldg., Providence, R. I. **$1,699,671.** CD 4/27—ENR 5/5.

Mass., Lowell—City, J. J. Flannery, mgr., City Hall, May 12, Bartlett School, Wannalancit and Clare Sts., from Volpe Constr. Co., 54 Eastern Ave., Malden, **$907,240** less **$700.** CD 5/16—ENR 5/19.

●Mass., Waltham—City of Waltham Housing Auth., City Hall, May 13, housing Proj. 200-1, Prospect Hill Rd., from Bennett-Stewart Co., Inc., 105 Newbury St., Boston, **$1,219,334.** CD 4/27—ENR 5/5.

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, received no bids Apr. 27, heating plant addns., removing, re-erecting Lumber Shed Bldg. No. T-245, Sandia Base, Eng-29-005-49-77. CD 4/20.

†N. M., Las Cruces—U. S. Eng., P. O. Box 1538, May 11, 100 single type family quarters, Serial No. Eng-29-005-49-75, from C. H. Leavell & Co., 1900 Wyoming St., El Paso, Tex., Lot 1, frame, **$396,600;** Lot 2, masonry type, **$545,325.** CD 4/19—ENR 4/21.

● N. Y., Brooklyn—New York City Housing Auth., 63 Park Row, New York, Zone 7, May 17, general contract Boulevard Houses, Proj. No. NYC-16, in area bounded by Linden Blvd., Ashford St., Wortman Ave., Hendrix St., Stanley and Schenck Aves., from George F. Driscoll Co. & Maccia Constr. Corp., 41 E. 42 St., New York, Zone 17, **$7,315,731*****heating and ventilating, from Afgo Eng. Corp. 331 Vanderbilt Ave., Zone 5, **$873,583*****electrical work, from Herman H. Schwartz, Inc., 391 Fulton St., Zone 1, **$409,400*****plumbing, from Jesse E. Kahn, 131 W. 21 St., New York, Zone 11, **$1,006,480.** CD 4/27—ENR 5/5.

●N. Y., Flushing—Supt. School Buildings, Design and Construction, 49 Flatbush Ave. Exten., Brooklyn, Zone 1, May 18, general contract, P. S. 177, 188 St. from 56 to 58 Aves., from Caristo Constr. Corp., 26 Court St., Brooklyn, Zone 2, steel **$1,097,000;** concrete **$1,070,000.** CD 4/21—ENR 5/12.

●N. Y., New York—New York City Housing Auth., 63 Park Row, Zone 7, May 17, foundations, appurtenances for Marble Hill Houses, Proj. No. NYC-15 in area bounded by Broadway, Exterior St., W. 225 St., Broadway, W. 228 St., Marble Hill Ave., W. 230 St., from John Rosenblum, Inc., 1841 Broadway, Zone 23. **$1,856,494.** CD 4/14—ENR 4/21.

O., Akron—University of Akron, E. Buchtel Ave., May 12, general contract, 4 story, 65x165 ft., brick chemistry bldg., Buchtel Ave., from Clemmer Constr. Co., 134 E. Thornton St., **$447,336.** CD 4/14—ENR 5/5.

O., Columbus—Ohio State University, N. High St., Geo. L. Sowers, dir. P. Wks., Columbus, Apr. 12, general contract electrical engineering bldg., Neil and 19 Ave., from Huber Hunt & Nichols Co., Speedway, Indianapolis, Ind. **$448,188.** CD 3/15—ENR 3/17.

O., Rocky River—Rocky River Bd. Educ., 20310 Detroit Rd., May 12, 2 story, brick, stone high school, from R. S. Ursprung Co., 705 Hanna Bldg. Annex, Cleveland, **$712,491.** CD 5/5.

O., Struthers—Bd. Educ., Struthers, general contract Memorial gymnasium at high school and modernization from C. C. Kaiser & Sons Co., 100 E. Rayen Ave., Youngstown, **$525,442.** CD 4/20—ENR 5/5.

Ore., Portland—School Dist. 1, 631 N. E. Clackamas St., John Jacob Astor and Chief Joseph Primary Schools and Sitton Primary School addn., from E. E. Settergren, Henry Bldg., Portland, **$400,000.**

Tex., Dallas—City, City Hall, Main and Harwood Sts., and Dallas Co., Courthouse, May 12, 1 and 2 story, masonry Juvenile Detention Home and administration bldg. for boys and girls, rein.-con. fdn. and frame, air-conditioning, from T. C. Bateson Constr. Co., 624 Irwin-Keasler Bldg., **$683,600.** CD 4/26—ENR 4/26.

Va., Blacksburg—Virginia Polytechnic Institute, Blacksburg, May 6, Agricultural Units 3, 4, and 5, from McDevitt & Streets Co., Builders Bldg., Charlotte, N. C., **$485,300.** CD 4/6—ENR 4/14.

●Va., Montevideo — Rockingham Co. School Bd., rejected bids Apr. 28, high school, L. B. **$1,647,000.** CD 5/5—ENR 5/12, under LB.

Wis., Port Washington—Bd. Educ., Port Washington, Apr. 28, general contract, school, from Valley Constr. Co., Chapman Ave., Neenah, **$398,986.** CD 4/12—ENR 4/14.

CONTRACTS AWARDED

Ariz., Douglas—Town, high school, 20 classrooms, home economics, music, libarary, science, administration bldgs. and auditorium, to Doan-Donaldson Constr. Co., 321 S. 24 St., Phoenix, **$427,233.** Awarded 4/25.

Calif., Manhattan Beach—Redondo Beach High School School Dist., 315 N. El Redondo St., Redondo Beach, Mira Costa High School, to Curlett Constr. Co., 830 W. Esther St., Long Beach, **$646,084.** Bids 5/3, awarded 5/4. CD 5/11—ENR 5/19, under LB.

Calif., Stockton—State Div. Architecture, P. Wks. Bldg., Sacramento, 1 and 2 story, 47,000 sq. ft. rein.-con. female patients ward, 1 story bsmnt., 50x135 ft., concrete warehouse, 60x144 ft. metal covered garage at Stockton State Hospital, to Nomelleni Constr. Co., Box 542, Stockton, **$742,000.** Bids 4/26. CD 5/2—ENR 5/5, under LB.

Conn., Greenwich—Town Bd. Educ., Greenwich, 2 story bsmnt., 60x100 ft., brick, steel, concrete Havemeyer School addn., Greenwich Ave., to Rathgeb Walsh, Inc., 1 Martin Pl., Port Chester, N. Y. Approx. **$45,000.** Bids 4/29.

Conn., Storrs—State, G. Albert Hill, state hy. comr., State Capitol, Hartford, 90 duplex cinder block precast concrete apartments, University of Connecticut, to Associated Constr. Co., 1010 Wethersfield Ave., Hartford, **$923,000.** Bids 5/4. CD 5/17, under LB.

●**Conn., Storrs**—State, (Raymond A. Thatcher, comptroller, State Capitol, Hartford, Group C, 6 dormitories, Proj. B/A D-111, University of Connecticut, to Gilbane Bldg. Co., 90 Calverly St., Providence, R. I., **$1,467,512.** Bids 4/5. CD 4/12—ENR 4/14, under L. B.

†**Ga., Fort Benning**—U. S. Eng., 2301 Grant St., Mobile, 7, Ala., family type quarters, Serial No. Eng-01-076-49-125; utility and site imprvs. for family type quarters, Serial No. Eng-01-076-49-138, to Williams Constr. Co., 1032 13 St., Columbus, **$734,150.** Bids 5/4. CD 5/10—ENR 5/12.

Ky., Lexington — University of Kentucky, Lexington, service bldg., to George H. Rommel Co., 958 Logan St., Louisville, **$769,000.** CD 3/25—ENR 3/31, under LB.

†**Md., Fort George G. Meade** — U. S. Eng., 1 and Douglas Sts. N.W. Wash., D. C., 2 story, brick, concrete row houses, colonial family quarters, to Aetna Constr. Co., 5318 Beaufort Ave., Baltimore, **$662,852.** Bids 4/28. CD 4/5—ENR 4/7.

●**Mass., Boston**—City of Boston Housing Auth., 10 Post Office Sq., 154 unit veterans housing development, Washington St., Hyde Park and Favre St., Mattapan, to Jefferson Constr. Co., 75 First St., Cambridge, **$1,457,198.** Bids 4/29, awarded 5/11. CD 5/11—ENR 5/19, under LB.

●†**N. M., Albuquerque**—U. S. Eng., P.O. Box 1538, 1 and 2 story, 320x360 ft. steel frame industrial type bldg., mon. conc. extens., masonry interior walls, Bldg. A-17, Sandia Base, Serial No. 291-49-90 to R. J. Daum Constr. Co., 1005 W. Coal St., **$2,881,114.** Est. $1,000,000. Bids 4/26. CD 5/3—ENR 5/5, under LB.

†**N. M., Albuquerque**—U. S. Eng., P. O. Box 1538, bachelor officers quarters, Job. No. EOP 919, Eng-29-005-49-73, to Robert E. McKee, 1900-32 Texas St., El Paso, Tex., **$849,700.** **$923,000.** Bids 5/4. CD 5/17, under LB.

N. Y., Brooklyn—Supt. School Bldgs., Design & Construction, 49 Flatbush Ave. exten., Zone 1, general contract (east wing) addn. to P. S. 92, Parkside and Rogers Aves., to T. G. K. Constr. Co., Inc., 55 W. 42 St., New York, **$931,319.** Bids 4/4. CD 4/7—ENR 4/14, under LB.

●**N. Y., Great Neck**—Bd. Educ, Union Free School Dist. 7, Saddle Rock School, Bayview Ave. and Hawthorne Lane, to William A. Berbusse Jr., Inc., 101 Park Ave., New York, Zone 17, **$1,299,000.** Bids 4/19. CD 4/21—ENR 4/28, under LB.

●**N. Y., New York**—Port of New York Auth., 11 Eighth Ave. Zone 11, steel work for bus terminal, Contr. BT-3, to Harris Structural Steel Co., 419 4 Ave., **$1,931,130.** Bids 4/20. CD 4/22—ENR 4/28, under LB.

●**O., Columbus**—Ohio State University, Columbus, general contract Student Union Bldg., to Struck Constr. Co., Louisville, **$2,274,300***** plumbing, drainage and heating, and ventilating, to The Sauer Co., 368 N. Washington Ave., **$488,336*****electrical work, to Gustav Hirsch Organization, 310 W. Broad St., **$208,280.** Grand total $2,970,916. Bids 5/12. CD 4/11—ENR 4/21.

Tenn., Jackson—City, Grammar School, to P. Smith Constr. Co., Jackson, **$412,130.** Bids 5/10.

Tex., Houston—Houston Independent School Dist., 1600 Washington St., rehabilitation and addns. to Milby High School, to Thomas Bryan & Assoc., M & M Bldg. **$760,498.** Bids 5/5, awarded 5-13—CD 5/11—ENR 5/19, under LB.

●**Ont., Toronto**—Hydro Electric Power Comn., 620 University Ave., radiant boiler units for pulverized coal feed to be installed in steam generating plant, Turping Basin, south of Commissioners St., to Babcock, Wilcox & Goldie-McCullock, Ltd., 64 Grand St. S., Galt, Approx. **$2,500,000.**

COMMERCIAL BUILDINGS

BIDS ASKED

May 31

●**Mass., Cambridge**—Harvard University, Cambridge, seven 3 or 4 story bsmnt., concrete, brick steel bldgs., Graduate Student Housing Center, Jarvis Field. $3,000,000. Architects Collaborative, 1430 Massachusetts Ave., Cambridge, archt. Charles T. Main, Inc., 80 Federal St., Boston, engr. CD 10/21—ENR 11/4.

June

Minn., Sauk Center — Franciscan Sisters, Sauk Center, 3 story, 34x44 ft. and 42x226 ft. hospital, $700,000. F. W. Jackson, St. Cloud, archt. CD 9/13/45—ENR 9/27/45.

June 1

Ga., Atlanta—Plantation Pipe Line Co., c/o Moscowitz, Willmer & Millkey, archts., 1000 Peachtree St. N. E., office. $400,000. CD 2/25—ENR 3/10.

Ia., Davenport—St. Lukes Hospital, 1224 E. High St., hospital addn. $300,000. Extended date. Schmidt, Garrison & Erickson, 104 S. Michigan Ave., Chicago, Ill., archts. CD 4/8—ENR 4/14.

Minn., Winona — Young Mens Christian Assn., S. A. Boyd, genl. secy., Winona, 3 story, bsmnt., 118x185 ft. Y. M. C. A. bldg. $500,000. B. A. Weber, 221 N. LaSalle St., Chicago, Ill., archt. CD 5/16.

June 2

Ala., Birmingham—St. Vincent's Hospital, c/o Charles H. McCauley, archt., Jackson

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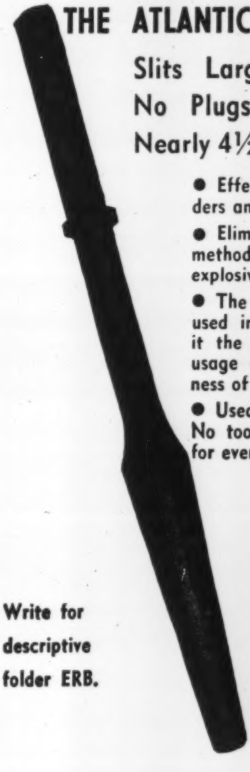

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Bldg., hospital annex, Plans deposit $35. CD 1/17—ENR 1/20.

Wis., Green Bay—St. Joseph's Catholic Congregation 3 story, bsmnt., 58x106 ft. rein.-con., steel, brick, tile Parochial School addn., Plans deposit $25. L. A. Geniesse, 226 N. Washington St., archt.

Que., Bedford—Catholic School Comn., Bedford, school and residence. Plans deposit $25. L. Parent, 3776 Queen Mary Rd., Montreal, archt.

June 3

Wash., Pullman—Funk, Molander & Johnson, archts., Sun Life Assurance Bldg., Spokane, 5 story masonry, concrete hospital addn. for Finch Memorial Hospital, Pullman. $340,000.

June 6

O., Conneaut—Brown Memorial Hospital, W. T. Ross, chn., Conneaut, hospital. $508,000. CD 5/17—ENR 5/27.

June 7

Kan., Larned—St. Joseph Memorial Hospital, hospital. $275,000. Cayton & Murray, Abilene, archts.

Miss., Greenville — St. Josephs Catholic Church, c/o Wm. R. Burk, archt., Pan American Bldg., New Orleans, La., parochial school. Extended date. CD 2/10—ENR 3/17.

Tex., Austin—Austin Presbyterian Theological Seminary, 100 W. 27 St., library part 2 and 3 story masonry bldg. units, partial bsmnt. $250,000. Plans deposit $25. Marvin Eichenroht, 702 Maverick Bldg., San Antonio, archt. CD 10/19/44—ENR 11/2/44.

Bids Asked

Ill., Niles—Catholic Bishop of Chicago, 719 N. Wabash St., Chicago, 5 story, rein.-con., stone brick, Home for Aged. L. Strelka, 1103 Westgate, Oak Park, archt.

Mass., Newton—Owner, c/o Arthur Manaselian & Assoc., archts., 30 Huntington Ave., Boston, three 2 story, bsmnt., brick apartments, incl. 35 units, Crystal Lake, Norwood Ave. and Centre St. $350,000. CD 11/1—ENR 11/11.

N. Y., New York—Workman's Circle Foundation, 150 Broadway, Zone 7, 3 story, old age home bounded by Grace, Hammersley, Ely and Burke Aves. $850,000. George W. Swiller, 535 E. Tremont Ave., Zone 5, archt. CD 3/24—ENR 4/7.

N. C., Whiteville—Building Com., Whiteville Hotel Corp., 1st Natl. Bank Bldg., Whiteville, hotel. Plans deposit $25 general, $15 mechanical. Frank B. Simpson, 110½ Fayetteville St., Raleigh, archt. CD 11/7/47—ENR 11/20/47.

Pa., Ambler—Allen H. Moore, archt., Fort Washington, club house for Sons of Italy Order, c/o archt. $250,000.

Tex., San Antonio—Belmeade Corp., c/o Albert Steves, III, 716 E. Commerce St., community center. $250,000. Glenn C. Wilson, 1510 Majestic Bldg., archt. CD 4/6—ENR 4/21.

SOON LETS CONTRACT

Conn., Wallingford—Southern N. E. Telephone Co., 227 Church St., New Haven, soon lets contract 1 story, bsmnt., brick, concrete telephone bldg., incl. razing 2 bldgs. on site, N. Main St. Douglas Orr, Grove St., New Haven, archt.

Fla., Miami Beach—Shore Club Hotel, c/o Albert Anis, archt., 420 Lincoln Rd. Penthouse, soon lets contract 150 room hotel. Over $250,000. Bids 4/16/48 rejected. CD 4/29/48—ENR 5/6/48, under LB.

Miss., Jackson—Millsaps College, c/o N. W. Overstreet & Assoc., archts., 201 N. Lamar St., soon lets contract Christian Center Bldg., 26,900 sq. ft.

Mo., Overland (St. Louis, Zone 14, P. O.)—All Souls Catholic Parish, Rev. Walter Tucker, pastor, 9602 Milton Ave., soon lets contract 1 story, bsmnt, 78x141 ft. brick, concrete, stone church, 2 story, bsmnt., 41x67 ft., brick, concrete, stone rectory, Hood and Tennyson Aves. $250,000. A. F. & Arthur Stauder, 3608 S. Grand Blvd., St. Louis, Zone 18, archts. CD 5/10—ENR 5/12.

O., Findlay—Evangelical Brethren Church, Findlay, soon lets contract church. Boyd G. Martin, 256 E. North Broadway, Columbus, Zone 2, archt.

O., Granville—Denison University, Granville, soon lets contract community center. $750,000. William Gehron, 101 Park Ave., New York 17, N. Y., archt.

Tenn., Knoxville—East Tennessee Crippled Childrens Hospital, c/o Shelton & Stachel, archts., 205 Moody Ave., soon lets contract hospital addn. Approx. $300,000. CD 1/20—ENR 2/3.

Tenn., Nashville—Crescent Amusement Co., c/o Marr & Holman, archt., Stahlman Bldg., soon lets contract theater and shopping center, Gallatin Rd. and Masonic Dr. $300,000. CD 3/7/47—ENR 4/4/46.

Tex., Beaumont—First Baptist Church Congregation, 848 Broadway, soon lets contract 3 story, 92x135 ft. educational bldg. $300,000. W. B. Livesay, 325A San Jacinto Life Bldg., archt. CD 3/3—ENR 3/17.

Tex., Houston—Jewish Community Center, 4701 Caroline St., soon lets contract construct Units 1 and 4, of community center, masonry constr., concrete slab fdn. $300,000. L. Gabert, 1315 Bell St., archt. W. J. Wisdom, 3102 Wichita St., assoc. archt. Walter P. Moore, 4605 Montrose Blvd., structural engr. I. A. Naman, 1309 Anita St., mechanical engr. CD 9/1—ENR 9/9.

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Va., Norfolk—Gleeson & Mulrooney, archts., Fox Bldg., Phila., Pa., soon lets contract catholic central high school for Sacred Heart High School Roman Catholic Diocese of Richmond, Diocese Offices, Richmond, $600,000. T. David Fitz-Gibbon, Royster Bldg., Norfolk, assoc. archt. CD 4/27—ENR 5/5.

LOW BIDDERS

Ala., Anniston—Sears, Roebuck & Co., 675 Ponce de Leon Ave. N. E., May 9, retail department store, from Frank H. Brownette Co., 430 W. Monroe St., Jacksonville, Fla. CD 5/2—ENR 5/21.

Ala., Mobile—Veterans Co-operative Home Bldg. Co. Assn., Inc., 1559 Beach St., general contract 96 rental houses, from Meriweather Constr. Co., Mobile, **$495,998.** CD 5/2—ENR 5/5.

Minn., Anoka—St. Stephens Catholic Parish, Anoka, May 3, general contract 2 story, bsmnt., 169x179 ft. L-shaped school, from Peterson Constr. Co., 620 National Bldg., Minneapolis. **$417,000.** CD 4/27—ENR 5/5.

Mo., St. Louis—Third Baptist Church, Dr. C. Oscar Johnson, pastor, 620 N. Grand Blvd., Zone 3, and Church Bldg. Com., c/o L. Baylor Pendleton & Wm. B. Ittner, Inc., assoc. archts., 408 Bd. Educ. Bldg., 811 Locust St., Zone 1, rejected bids May 10, 5 story, 58x79 ft. stone, brick, tile, rein.-con. church addn., Grand and Washington Blvds. L. B. **$852,991.** Will re-advertise. CD 5/9—ENR 5/12.

●**N. C., Asheville**—Richard L. Coleman, F. B. Short & Z. B. Robinson, Asheville, will not construct 270 apartment units in Grove Park Sect. Project abandoned. Approx. **$1,000,000.** CD 5/6—ENR 5/12, under CA.

N. C., Newton—Newton-Conover Hotel Corp., Newton, rejected bids Feb. 23, 48 room hotel. CD 2/15—ENR 2/17.

●**Tex., Fort Worth** — Broadway Baptist Church, 305 W. Bway., rejected bids Sept. 29, church and auditorium. **$1,098,000.** Will readvertise on revised plans. CD 10/5/48—ENR 10/7/48, under LB.

CONTRACTS AWARDED

Calif., Long Beach—Lakewood City Co., 4100 Bellflower Blvd., 53 frame, stucco dwellings and garages in Lakewood Village, Owner builds, **$451,000.**

Calif., Los Angeles—Wystone Corp., 9700 W. Pico Blvd., 120 frame, stucco dwellings . Owner builds. **$500,000.**

●**Calif., Los Angeles**—Liberty Bldg. Corp., 5548 Arbor Vital St., 91 stucco dwellings, Glasgow Pl and W. 99 Pl. Owner builds. **$1,063,780.** J. H. MacDonald, 1013 E. 8 St., archt.

●**Calif., Monterey Park** — Angelus Building Co., 130 S. Atlantic Blvd., Los Angeles, 193 dwellings and garages, Tract 15679, Owner builds, **$1,452,000.**

●**Calif., Walnut Creek**—Blackfield Constr. Co., 2229 MacDonald Ave., Richmond, 350 residences in Meadow Homes addn. Owner builds. **$2,800,000.**

Fla., Miami Beach—Shore Club Hotel, c/o contractor, 150 room hotel, to Robert Turchin, 5800 Collins Ave., Miami Beach, Approx. **$500,000.** CD 5/9—ENR 5/12, under LB.

●**Ill., LaGrange**—Nazareth Academy, 200 N. Brainerd St., 2 and 3 story, steel, brick, rein.-con. girls school addn., to George Sollitt Constr. Co., 109 N. Dearborn St., Chicago, **$1,200,000.** Bids 4/12, awarded 4/15. CD 3/22—ENR 3/31.

●**Ill., Oaklawn**—J. E. Merrion Co., 228 N. LaSalle St., 1,600 unit single family and duplex houses, 87 and Crawford Aves., incl. sewers, water connections, own forces, **$14,500,000.** Emil Minx, Skokie, archt.

●**Ind., Mishawaka**—Poor Sisters of St. Francis, Seraph of The Perpetual Adoration, Mt. Alverno, general contract superstructural five convent bldgs., 3 story, 60x225 ft., 3 story, 48x211 ft., 2 story 126x188 ft., 1 story 100x220 ft., 2 story, 110x164 ft., incl. administration bldg., dormitory, dining hall, power plant and chapel, to Sollitt Constr. Co., 301 S. Columbia St., South Bend, Approx. **$3,000,000.** D. A. Bohlen & Son, 930 State Life Bldg., Indianapolis, archts. CD 7/25/47—ENR 8/7/47.

Mass., Hyannis—Cape Cod Hospital, Admin. Office, Hyannis, hospital addns., alterations, to Theodore Loranger & Sons, 404 Nash Rd., New Bedford, **$880,402.** Bids 4/21, awarded 5/11. CD 5/11—ENR 5/19, under LB.

Mo., Kansas City—Appleman Home for Aged Jews, Myer M. Rich, chn., Moshar Zkeinim Home for Aged Society, 2850 Troost Ave., general contract 3 story, 45x210 ft. and 45x90 ft. T-shaped rein.-con., brick stone home for aged, 8 and Holmes Sts., to Frank Quinlan Constr. Co., 407 Liberty St., Kansas City, Mo., Approx. **$500,000** to **$600,000.** CD 11/10—ENR 11/18.

Mo., St. Louis—Scheurmann Bldg. & Realty Co., 5934 Natural Bridge Ave., Zone 20, seventy-four 1 story, 25x34 ft. brick houses, 10x20 ft. attached garages, Gast Pl., Riverview Blvd., Church Rd., Melvin, Jordan and Frederick Aves., northern part of city, separate contracts, Approx. **$700,000.** Robert G. McMahon, 7649 Delmar Blvd., University City, Zone 5, archt.

N. J., Passaic—Spiegel & Cosden, c/o Erwin Gerber, archt., 1180 Raymond Blvd., Newark, 3 story apartment development for 109 families, Harrison Ave. between Lexington and Hope Aves. Owner builds, **$500,000.**

N. Y., Brooklyn—St. Therese of Lisiex, 563 Sterling Pl., Zone 16, convent and school addn., Church Ave. and Avenue D, to Tweedy Eng. Co., 356 Pacific St., Zone 2, **$425,000.** T. H. Irving, 261 Broadway, New York, Zone 17, archt.

N. C., Winston-Salem—Miller Park Apartments, c/o contractor, 24 apartments, to The Crystal Lumber Co., 620½ W. 4 St., **$519,524.**

O., Bay Village—Selby Constr. Co., 13542 Detroit Ave., Lakewood, Zone 7, forty-eight 1½ story, frame residences, 26905-08-14 Midland Rd., separate contracts. **$480,000.**

O., Brooklyn—Harry Haltz, 3372 E. 142 St., Cleveland, forty-three 1½ story, bsmnt., residences, Orchard Ave., separate contracts. **$516,000.**

O., Euclid—Sam Feiner, Inc., 2419 Canterbury Rd., Cleveland Heights, forty-eight 1½ story residences, Walworth and E. 255 St., separate contracts. **$768,000.**

O., North Olmsted—N. F. Malnar, 22591 Lorain Rd., Fairview Village, 42 one story frame residences, Lucydale, Whitehorne and Andrew Sts., separate contracts. **$400,000.**

O., South Euclid—Ray D. Lawrence, 1648 E. 77 St., Cleveland, twenty 1½ story frame residences, 4209-13-17 Harwood St., separate contracts **$440,000.**

Pa., Huntingdon—J. C. Blair Memorial Hospital, Huntingdon, 3 story, bsmnt., T-shaped, brick, stone hospital, to Berkebile Bros., 302 Swank Bldg., Johnstown, **$604,768.** Bids 4/28. CD 4/13—ENR 4/21.

●**Pa., Phila.**—Joseph J. Kelly Co., 69 and Walnut Sts., Upper Darby, residential development, 75 and 76 Sts., Malvern and Woodcrest Aves., separate contracts, **$1,000,000.** Erling Wenge, McClatchy Bldg., Upper Darby, archt.

Pa., Phila.—Meridian Housing Corp. 1420 Walnut St., residential development, Leon and Rhawn Sts., separate contracts, Approx. **$500,000.**

●**Pa., Phila.**—Owner, c/o R. M. Waddington, 7102 Frankford Ave., residential development, Rhawn St. west of Summerdale Ave., separate contracts, **$1,250,000.**

●**S. C., Columbia**—Woodland Terrace, Inc., c/o contractor, 174 apartment units, to Lyles & Lang Constr. Co., c/o Lyles, Wm. G. Bissett, Carlisle & Wolff, archts., 1302 Main St., Columbia. Approx. **$1,545,000.**

Tex., Houston—H. & D. Constr. Co., 527 N. Adams St., 35 dwellings, El Rancho St., Sect. 3 of Santa Rosa, Owner builds, **$350,000.** CD 5/9—ENR 5/26.

Tex., Houston—R. C. Heiner, 7443 Park Pl. Blvd., 100 unit rental apartment. Owner builds. **$450,000.** CD 5/9.

Tex., Houston—Mathews Bros., 2904 Quenby Rd., 60 addnl. dwellings, Ayshire, Bellaire and Montclair Addns., own froces. Approx. **$950,000.** CD 5/9—ENR 5/26.

Tex., Houston—Southway Manor, c/o F. A. Hunter, 5007 Telephone Rd., addnl. apartment construction, Southway Manor. Owner builds. Approx. **$480,000.** CD 5/13.

Tex., Houston—C. M. Wright, 9824 E. Montgomery Rd., 85 dwellings. Owner builds. Approx. **$450,000.** CD 5/13.

Wash., Seattle—Albert Balch Community Bldg., 8050 35 Ave. N. E., 77 houses, day labor. **$450,000.** CD 3/3—ENR 3/11/48.

Ont., Ottawa—Oblate Father's Scholasticate, Main St., between Oblate Ave. and Clegg St., Ottawa East, 1 story, rein.-con., stone bldg. addns., alterations, power house, to Albert Bedard, 132 St. Patrick St., Quebec City, Que., Approx. **$500,000.** Des Haies & Depocas, 1172 Sherbrooke St. W., Montreal, Que., archt.

INDUSTRIAL BUILDINGS

BIDS ASKED

May 31

Tenn., Memphis — EQUIPMENT PARTS DEPOT — International Harvester Co., c/o Walk C. Jones and Walk C. Jones, Jr., archts., 1215 Poplar St., equipment parts depot.

W. Va., Oak Hill—BUS TERMINAL—Belann Realty Co., c/o Irving Bowman, archt., 613 Atlas Bldg., Charleston, bus terminal.

June 6

Ind., Anderson—BAKERY—Omar, Inc., 1910 Harney St., Omaha, Neb., wholesale bakery. $85,000. Luria Eng. Co., 500 5 Ave., New York, N. Y., engr.

Ind., Green Castle—BAKERY—Omar, Inc., 1910 Harney St., Omaha, Neb., wholesale bakery, $85,000. Luria Eng. Corp., 500 5 Ave., New York, N. Y., engr.

Ia., Corning—BAKERY—Omar, Inc., 1910 Harney St., Omaha, Neb., wholesale bakery, $90,000. Luria Eng. Co., 500 5 Ave., New York, N. Y., engr.

Ia., Des Moines—BAKERY—Omar, Inc., 1910 Harney St., Omaha, Neb., wholesale bakery. $125,000. Luria Eng. Co., 500 5 Ave., New York, N. Y., engr. CD 4/26.

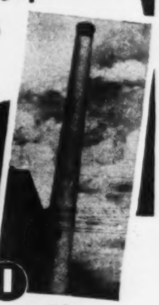
Neb., Lincoln—BAKERY—Omar, Inc., 1910 Harney St., Omaha, wholesale bakery branch. $90,000. Luria Eng. Co., 500 5 Ave., New York, N. Y., engr.

Wis., Madison—BAKERY—Omar, Inc., 1910 Harney St., Omaha, Neb., wholesale bakery branch. $100,000. Luria Eng. Co., 500 5 Ave., New York, N. Y. engr. CD 4/26.

About July 1

La., New Orleans—SALES and SERVICE—Stephens Buick Co., c/o Frevet & Wolf, archts., 630 Gravier St., 3 story, 160x210 ft. auto sales and service bldg. $700,000.

SOLVE concrete, metal maintenance problems with Arco's Big 3!



Glen Alden Coal Co., Eshley, Pa.
Applier: Alphons Custodis Chimney Construction Co., New York, N. Y.

1

Stack Dum Dum Gives Lasting Protection to Concrete Stacks, Chimneys

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BRIDGES CRACKS—Eliminates the chief source of destructive surface deterioration.

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HEALS ITSELF—If outer surface is broken, under-surface heals at point of abrasion.

2 DUM DUM FOR METAL Its heavy film protects exposed metal surfaces against weather, fumes and gases. Stops rust and corrosion.

3 DUM DUM MASONOC Heavy film, not a paint, Dum Dum Masonoc's thick, tough, elastic coat gives many years added protection against the ravages of weather-wear.

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Name Title
Company
Street & No.
City Zone State

ARCO Maintenance Products

Bids Asked

●Tex., Rio Grande City—GASOLINE PLANT Continental Oil Co., Ponca City, Okla., natural gasoline plant expans. **$1,500,000.** CD 5/20.

SOON LETS CONTRACT

Calif., Bakersfield — STORAGE — Richfield Oil Co., 555 Flower St., Los Angeles, soon lets contract 1 story, bsmnt., drill tool storage bldg., approx. $68,000. Russell & Samaniego, 3275 Wilshire Blvd., Los Angeles, archts.

Calif., Los Angeles — FACTORY — The Frito Co., 5320 Santa Fe St., soon lets contracts factory office, corn silo and grain elevator. $175,000. K. H. Neptune, 441 N. Beverly Dr., Beverly Hills, archt.

Conn., Stratford — STORAGE — A. W. Burritt Co., 415 Knowlton St., Bridgeport, soon lets contract 1 story, brick, cinder block storage bldg., W. Broad St. $68,000. Fletcher Thompson, Inc., 211 State St., Bridgeport, archt.

Miss., Gulport — SALES and SERVICE — Stanton Motor Co., c/o H. D. Shaw & Assoc., Salloum Bldg., soon lets contract auto sales and service bldg.

CONTRACTS AWARDED

Ia., Marshalltown—SHOP—Minneapolis & St. Louis Railway Co., C. S. Weatherill, ch. engr., Northwestern Bank Bldg., Minneapolis, Minn., diesel locomotive repair shop, to James Leck Co., 211 S. 11 St., Minneapolis, Minn., **$400,000.**

Mich., Mount Clemens—TECHNICAL CENTER—General Motors Corp., General Motors Bldg., Detroit, Zone 2, 235,000 sq. ft. technical center, incl. Engineering bldgs. (administration and drafting, shop and dynamometer bldgs.) 427,000 sq. ft. research laboratories div. (metallurgical, laboratory, mechanical and processing bldgs.) power plant, sewage disposal plant, pump house, and reservoir, water tank, central kitchen, etc. Macomb Co., near here to Bryant & Detwiler Co., 2304 Penobscot Bldg., Detroit, Zone 26, Saarinen, Saarinen & Assoc., Bloomfield Hills, archts. Smith, Hinchman & Grylls, Inc., 800 Marquette Bldg., Detroit, Zone 26, archt. and engr.

N. J., Linden—PLANT—International Harvester Co., 122 E. 42 St., New York 17, N. Y., distributing plant, W. Linden Ave. at Stiles St., to Joseph L. Muscarelle, Inc., 42 First St., Hackensack. Approx. **$464,000.**

Tex., Decatur—PLANT—Cities Service Oil Co., Bartlesville, Okla., casinghead gasoline plant unit, own forces. Approx. **$750,000.** CD 1/27—ENR 2/17.

Tex., Jourdanton—GENERATING UNITS—Humble Oil & Refining Co., Humble Bldg., Houston, 3 kw. generating units, to Hudson Eng. Corp., 2711 Danville St., Houston, **$150,000.**

●Alta., Leduc — PLANT — Imperial Oil Ltd., 50 Church St., Toronto, Ont., compressor station and gasoline absorption plant, Leduc sector, Leduc Oilfields, to C. F. Braun Co. Inc., Alhambra, Calif., U. S. A., Approx. **$6,500,000.**

UNCLASSIFIED

BIDS ASKED

May 30

Ontario—LAND CLEARING—Hydro Electric Comn. of Ontario, 620 University St., Toronto, clearing land, approx. 300 acres, vicinity of Chenaus development, Ottawa River, Portage duFort.

June 1

Ill., West Frankfort — BATH HOUSE and SWIMMING POOL—Bd. Trustees Frankfort Community Park Dist., Gordon Dodds, Franklin School, 700 Block East St. Louis, bath house and swimming pool, equip. bldg., Frankfort Community Park, Cleveland St. Plans deposit $20. Cletis R. Foley, Rehfuss Bldg., 125 N. Jefferson St., Peoria, archt. CD 4/9/46.

June 2

†Colorado — TRANSMISSION LINES, etc. — Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, 115-kilovolt transmission lines, Granby Pumping Plant to Estes Power Plant and Marys Lake Power Plant to Estes Power Plant, between Granby and Estes Park and near Buchanan Pass on Continental Divide, Spec. 2647; 69-kilovolt transmission circuit, incl. cable from Estes Power Plant to west portal of Adams Tunnel and 115 kilovolt transmission line from Estes Power Plant to Marys Lake Power Plant, in and near end of the Alva B. Adams Tunnel between Grand Lake and Estes Park, Spec. 2646, both Colorado-Big Thompson Proj.

Nebraska—RURAL DISTRIBUTION LINES—North Central Nebraska Rural PP Dist., Creighton, 184.6 mi. rural distr. lines, in Antelope and Knox Counties, $55,000. Raymond H. Reed & Co., Columbus, engrs.

Nebraska—RURAL DISTRIBUTION LINES—Twin Valleys Electric Membership Assn., Cambridge, labor and furnish poles, 143.44 mi. rural distr. lines, Furnas and Harland Counties. $55,000. Flora Eng. Co., 501 Jackson St., Topeka, Kan., engr. CD 5/11—ENR 5/19.

Wash., Walla Walla—FISH HATCHERY—State Dpt. Game, Walla Walla, 40 trough fish hatchery on Tucannon River, near here. $70,000. Plans deposit $10. J. Lyon, Smith Tower, Seattle, ch. engr. CD 10/22—ENR 11/4.

†Wyoming — TRANSFORMERS — Bureau Reclamation, Dpt. Interior, Bldg 1-A, Denver Federal Center, Denver, Colo., instrument transformers for Thermopolis Substation, Transmission Lines Unit, Missouri River Basin Proj. Spec. 2632. Extended date. CD 4/6—ENR 5/5.

June 3

†Arizona—TRANSMISSION LINE TOWERS, etc. — Bureau Reclamation, Phoenix, foundations and erecting steel towers for Mesa-Coolidge 230 kw. transmission line Davis Dam Project, from Mesa to Coolidge, Spec. 2670.

†Oklahoma—U. S. Eng., P. O. Box 61, 2,000 N. Memorial Dr., Tulsa, 4 sets hydraulic turbine governing equip. for Fort Gibson Dam. $80,000.

June 7

Calif., Stockton—COW and CALF BARN—State Div. Hys., P. Wks. Bldg., Sacramento, cow and calf barn at Stockton State Hospital Farm. Plans deposit $25. Anson Boyd, state archt.

La., Breaux Bridge—NATURAL GAS SYSTEM—Town, Town Hall, natural gas sys. Extended date. J. B. McCrary Eng. Corp., 22 Marietta Street Bldg., Atlanta, Ga., engr. CD 5/12.

†Tex., Orange—TRANSFORMER SUBSTATION—Pub. Wks. Office, Eighth Naval Dist., Bldg. 16, Naval Station, New Orleans, La., transformer substation, incl. overhead pole lines, underground distr. sys., concrete slab fdn. and chain link fence enclosure at Naval Station, Spec. 22020. Plans deposit $10.

June 8

California—TRAFFIC SIGNALS, etc.—State Div. Hys., P. Wks. Bldg., Sacramento, furnishing, installing traffic signal and hy. lighting sys. at intersections Clay St. with Lafayette and Grant Sts. with Franklin St., Santa Clara, Santa Clara Co.; full traffic actuated signal systems and hy. lighting 3 intersections and semi-traffic actuated signals and hy. lighting at 2 intersections, near Vallejo, Solano Co. G. T. McCoy, state hy. engr

June 9

California — LANDSCAPING — State Div. Hys., State Bldg., Los Angeles, 1.7 mi. landscaping between 15 Ave. and Grant Ave., Escondido, San Diego Co. G. T. McCoy, P. Wks., Bldg., Sacramento, state hy. engr.

†Wyoming — STORAGE TANKS — Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point f.o.b. cars Casper, 2 horizontal, 4,000 gal. welded plate steel transformer oil storage tanks for Casper substation, Kendrick Proj., Spec. 2676.

SOON LETS CONTRACT

Tex., McAllen — RADIO STATION — Radio Station KRIO, c/o Zeb Rike, archt., 209½ S. Main St., soon lets contract 14x52 ft. and 14x49 ft. radio station, air-conditioning. $75,000.

Utah — RURAL DISTRIBUTION LINES — Sarkane Power Assoc. Inc., Richfield, soon lets contract 30 mi. 44 kv. power line, Garfield Co. Hollis W. Harris, 711 Kentucky St., Amarillo, engr. CD 6/4/48—ENR 6/17/48.

LOW BIDDERS

Alabama—RURAL DISTRIBUTION LINES—Cullman Electric Co-operative, Cullman, 12 mi. rural distr. lines, Cullman Co., from Southeastern Electric Constr. Co., Andalusia, **$133,843.** Bids 5/6. CD 4/29.

Alabama—RURAL DISTRIBUTION LINES—Joe Wheeler Electric Membership Corp., Hartselle, May 10, 382 mi. rural distr. lines, Morgan Co., etc., from Dent Constr. Co., Sheffield, **$534,512.** CD 5/6—ENR 5/12.

†Ia., Keokuk—CEMETERY IMPRVS.—U. S. Eng., 1709 Jackson St., Omaha, Neb., cancelled bids to have been opened May 17, imprv. Keokuk National Cemetery, Serial No. Eng. 25-066-49-1. Will readvertise. CD 5/4—ENR 5/12.

Kansas—RURAL DISTRIBUTION LINES—Smiky Hill Electric Co-operative Assn., Ellsworth, May 13, 260 mi. rural distr. lines, sys. imprvs., Ellsworth Co., from J. & J. Constr. Co., First National Bldg., Oklahoma City, Okla., **$420,913.** Est. $540,000. CD 5/11—ENR 5/19.

Mississippi—RURAL DISTRIBUTION LINES—Twin County Electric Power Assn., Hollandale, 220 mi. rural distr. line, Washington Co., from Irby Constr. Co., 815 S. State St., Jackson, **$205,026.** CD 3/31/48—ENR 4/8/48.

New York — BATHING DEVELOPMENT — Palisades Interstate Park Comn., Bear Mountain, May 5, Sebago Bathing Development, incl. 200,000 gal. reservoir, water and sewer pumping houses with equip., appurtenances in Harriman State Park, Orange and Rockland Counties, from E. Totonelly & Sons, Inc., Newburgh, **$180,184.** CD 4/14—ENR 4/28.

†New York—PIER—U. S. Eng., Engineer Park, Buffalo, Zone 7, repairing East Pier, Olcott Harbor, Eng-30-023-49-47, from Lang Constr. Co. Inc., 1011 Second St., Hampton, Va., **$131,423.** CD 3/28—ENR 3/31.

†Oregon—RAILROAD RELOCATION—U. S. Eng., Pittock Block, Portland, Zone 5, May 13, relocation Southern Pacific R.R., Stations 1435-1515 and Hy. 58, Stations 160x201, Lookout Point Dam, Lane Co., from Utah Constr. Co., 1 Montgomery St., San Francisco, Calif., **$837,295.** Est. $898,205. CD 1/19—ENR 1/27.

●†Alaska, Anchorage — RAILROAD — The Alaska Railroad, Dpt. Interior, Anchorage, May 11, widening right-of-way along 12 mi. Turnagain Arm south of Anchorage to permit installation of new tracks and building highway in place of present tracks, Indian to Potters, from Morrison-Knudsen Co., Inc., Peter Kiewit Sons Co. and S. Birch & Sons, Hoge Bldg., Seattle 4, Wash., **$5,436,036.** CD 4/18—ENR 4/21.

CONTRACTS AWARDED

†Calif., Point Mugu—ELECTRICAL DISTRIBUTION SYSTEM—U. S. Navy, Point Mugu, 6 mi. overhead electrical distr. lines and 1 mi. underground conduit, etc., to Malone-Campbell Electric Co., Box 197, Station B, Bakersfield, **$195,503.** Bids 4/21, awarded 5/6.

Conn., Waterbury—GAS TANKS—Connecticut Light & Power Co., 49 Leavenworth St., steel gas tanks, Railroad Hill St., own forces, **$525,000.**

Ky., Prestonburg—DRIVE-IN THEATRE—George Hereford, Pikeville, drive-in theatre U. S. 23, separate contracts. Approx. **$100,000.**

●Massachusetts — TRANSMISSION LINES—Boston Edison Co., 39 Boylston St., Boston, 16 mi. high power transmission lines, Waltham through Lincoln, Wayland, Sudbury, Framingham, Natick, Sherborn, and Weston. Owner builds. **$1,176,000.**

●Mo., St. Louis—RAIL REPLACEMENT—St. Louis P. Service Co., 39 St. and Park Ave., Zone 10, reconstructing 48 mi. street car tracks, along Broadway, Grand, Wellston, Hodiamont, Jefferson Park, Forest Park, Delmar and University-Olive St. car lines, own forces, **$3,420,000.** CD 9/24—ENR 9/30.

Oklahoma — RURAL DISTRIBUTION LINES—Central Rural Electric Co-operative, Stillwater, 481 mi. rural distr. lines, Lincoln Co., to R. E. Mattison & Co., Box 458, Britton, labor **$185,336,** material **$481,000,** total $666,336. CD 1/22—ENR 2/5.

Oklahoma — RURAL DISTRIBUTION LINES—Alfalfa Electric Co-operative., Inc. Cherokee, 381 mi rural distr. lines, Alfalfa Co. to R. E. Mattison & Co., Box 458, Britton, labor **$83,803,** materials **$381,000,** total $464,803. CD 2/11—ENR 3/17.

Oklahoma — RURAL DISTRIBUTION LINES—Red River Valley Rural Electric Assoc., Marietta, 88.7 mi. rural distr. lines, Love Co., to Irby Constr. Co., 817 S. State St., Jackson, Miss., labor **$66,104,** material **$188,000,** total $254,104. CD 4/5.

South Carolina—RURAL DISTRIBUTION LINES—Santee Electric Co-operative, Inc., Kingstree, 236.73 mi. rural distr. lines, Williamsburg Co., to F. J. Seastrunk Electric Co., 1731 Harden St., Columbia, labor **$97,569,** material **$236,000,** total $333,569. McCall-Thomas Eng. Co., Inc., 112 Church St. N. E., Orangeburg, engr. CD 10/15/47—ENR 10/30/47.

South Dakota—RURAL DISTRIBUTION LINES — Cam-Wall Electric Co-operative, Inc., Selby, 54.7 mi. rural distr. lines, Walworth Co., to Zontelli Constr. Co., Ironton, Minn., labor, **$18,911,** materials, **$54,000,** total $72,911. CD 4/21—ENR 5/12.

South Dakota — RURAL DISTRIBUTION LINES—Charles Mix Electric Assoc., Inc., Lake Andes, 515 mi. rural distr. lines, Charles Mix Co., to Ferguson-Diehl Constr. Co., Home State Bank Bldg., Jefferson, Ia., **$513,276.** CD 5/16.

South Dakota — RURAL DISTRIBUTION LINES—West River Electric Assoc. Inc., Wall, 280.32 mi. rural distr. lines, Pennington Co., to Philard, Inc., Redfield, labor **$84,486,** material **$280,000,** total $364,586. CD 9/14—ENR 9/30.

Tennessee — RURAL DISTRIBUTION LINE—Tri-State Electric Co-operative, Copper Hill, 197 mi. rural distr. line, Polk Co., to Killoren Electric Co., Appleton, Wis., **$326,137.** Patterson & Dewar Engineers, Rutland Bldg., Decatur, Ga., engrs.

Texas—RURAL DISTRIBUTION LINES—Deaf Smith County Electric Co-operative, Inc., Hereford, 184.2 mi. rural distr. lines, Deaf Smith Co., to Kennett & Pavlicek, Box 1205, San Angelo, labor **$46,478,** material **$184,000,** total $230,478. H. N. Roberts & Assoc., 1310 Avenue Q, Lubbock, engrs. CD 12/17—ENR 12/30.

Texas—RURAL DISTRIBUTION LINES—Floyd County Rural Electric Co-operative, Inc., Floydada, 251 mi. rural distr. lines, Floyd Co., to Basanda Constr. Co., Box 2564, Oklahoma City, Okla., labor **$63,499,** material **$251,000,** total $314,499. H. N. Roberts & Assoc., 1310 Avenue Q, Lubbock, engrs. CD 5/16.

Texas—RURAL DISTRIBUTION LINES—J. A. C. Electric Co-operative Assoc., Bluegrove, 124 mi. rural distr. lines, Clay Co., to B-Line Constr. Co., 520 First Natl. Bank Bldg., Oklahoma City, Okla., labor **$41,311,** material **$124,000,** total $165,311. Joe E. Ward, 545 Nacol Bldg., Wichita Falls, engr. CD 2/11—ENR 3/4/48.

Tex., Jourdanton — LOADING RACKS — Humble Oil & Refining Co., Humble Bldg., Houston, tank and truck loading racks, to Hudson Eng. Corp., 2711 Danville St., Houston, **$110,000.**

Virginia—RURAL DISTRIBUTION LINES—Northern Neck Electric Co-operative, Box 51, Warsaw, 75 mi. rural distr. lines, Lancaster Co., force account **$420,000.** CD 4/6 — ENR 4/28.

Alta., Devon—SWIMMING POOL—Community Assn., c/o V. H. Hunter, Imperial Oil Ltd., Edmonton, swimming pool to Jack McCalder, Devon. Approx. **$50,000.**

●Manitoba—POWER DEVELOPMENT—Dpt. Mines & Resources, Winnipeg, power plant, on Winnipeg River, aprox. 70 mi. northeast of Winnipeg, Pine Falls, to Foundation Co. of Canada Ltd., 1900 Sherbrooke St. W., Montreal, and Bird Constr. Co. Ltd., 708 Confederation Life Bldg., Winnipeg. Approx. **$10,000,000.** Bids 4/18. CD 3/23—ENR 4/7.

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- ✓ **B-Type units in 15 and 22 cubic yard (struck) sizes, for use with International TD-24 tractors.**

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CONSTRUCTION REPORTS—Third Section

WATER SUPPLY

BIDS ASKED

June 6

Ga., Talbotton—City, water distr. sys., 16,600 lin. ft. 2- to 8-in. c. i. pipe, 13,860 lb. c. i. fittings, 34 hydrants and 100,000 gal. steel water tank. Plans deposit $15. John J. Harte Co., 284 Techwood Dr., Atlanta, engrs.

June 10

Ky., Cave Spring—City, City Hall, WW imprvs. Approx. $50,000.

June 13

Ala., Haynesville—Lowndes Co., watermains and 60,000 gal. steel storage tank. Plans deposit $10. Donald Mills, Box 534, Selma, engr.

June 15

●**Calif., Los Angeles**—Dpt. Water & Power, 207 S. Broadway, Baldwin Hills Reservoir Proj., incl. 400,000 cu. yd. excav., embankment, trimming, tunnel excav., gate tower, paving reservoir, etc. $1,000,000. Plans deposit $50. S. B. Morris, c/o owner, engr. CD 5/24/46—ENR 6/13/47.

LOW BIDDERS

✝**D. C., Wash.**—U. S. Eng., First and Douglas Sts. N. W., Zone 25, rejected bids May 12, collector mains extens., Washington Aqueduct, McMillan Filtration Plant, Serial No. Eng-49-080-49-148. Will readvertise. CD 4/15—ENR 5/5.

Tex., Levelland—City, May 18, WW sys. imprvs., extens. from Fischer's Frank Burcher Co., 203 Frederick Rd., San Antonio, **$122,164.** CD 4/25—ENR 5/5.

CONTRACTS AWARDED

Que., L'Assumption—Village, C. Roy, secy., Village Hall, filter plant, to La Cie de Const. des Boulevards du Quebec, St. Basile, Approx. **$59,962**; filter equip., to Francis Hankin & Co. Ltd., 2028 Union Ave., Montreal, **$51,774.** C. E. Gravel, c/o owner, engr. Bids 5/16. CD 5/4—ENR 5/12.

SEWERS, WASTE DISPOSAL

BIDS ASKED

June 3

O., Akron—M. L. Davis, Service-Dir., Municipal Bldg., sewerage imprvs. W. Waterloo Rd., Shore St. to Manchester Rd. Plans deposit $5. CD 12/10/43—ENR 12/16/43.

June 6

Wis., Greenfield — Town, 7325 W. Forest Home Ave., West Allis, Zone 14, 10,285 lin. ft. 8 and 12 in. sanitary sewers in various streets. $50,000. H. C. Webster & Son, 739 N. 2 St., Zone 3, Milwaukee, engrs.

June 9

Ga., Atlanta—Fulton Co., c/o County Engr., 501 Courthouse, sanitary sewer projects S-20, S-38, S-43, S-47 and S-56. Approx. $50,000. Plans deposit $15.

June 15

Calif., Los Angeles—City Bd. P. Wks., 153 City Hall, 10,172 ft. 8-to 33-in. sanitary sewers 24 manholes, in De Soto Ave. and Sherman Way Sewer Dist., $168,797. CD 4/5—ENR 4/7, under LB; approx. 3 mi. sanitary sewers, imprvs., Oxnard St. and Colfax Ave. Imprvt. Dist., Approx. $50,000, CD 4/5—ENR 4/28. Lloyd Aldrich, city engr.

June 23

La., Houma—Mayor, sewerage sys. extens. De Traites & Ricketts, 316 E. Main St., Houma, engrs. CD 1/7/44—ENR 1/27/44.

July 1

Ore., Beaverton—City, City, sewerage sys. incl. treatment plant, 2 pumping stations, storm and sanitary sewers. $225,000. Plans deposit $25. John W. Cunningham, Spalding Bldg., Portland, engr. CD 9/7/48 — ENR 9/16/48.

LOW BIDDERS

Calif., Belvedere—City, City Hall, sanitary sewerage sys., pumping and treatment works, from Macnsons 151 Tehama St., San Francisco, Schedule A, **$119,072** Schedule B, **$82,008.** CD 5/2—ENR 5/5.

Calif., Fresno—City, City Hall, Apr. 25, 5 mi. sanitary sewers, from Stockton Constr. Co., Box 2087, Stockton, Sect. 1, **$491,800.** CD 4/12—ENR 4/14.

Calif., Huntington Park—City, 6550 Miles Ave., May 16, Compton Creek No. 1 Storm Drain, 56 catchbasins, 12 manholes, 5,162 ft. 12-to 48-in. concrete pipe, from Burch & Bebek, Lynwood, **$86,837.**

Ind., Seymour—Bd. P. Wks., Seymour, rejected bids May 20, interceptor and lateral sewers, $80,000. Will readvertise. CD 5/10—ENR 5/12.

Ia., Earlville—City, City Hall, received no bids Apr. 21, sewage plant. Will readvertise, CD 4/13.

Minn., St. Louis Park—Village, J. Justad, clk., Village Hall, rejected bids May 9, Sanitary Sewers 21 and 2J, CD 5/19—ENR 5/26, under LB.

O., Bay Village—Village, Village Hall, 350 Dover Center Rd. 5 storm sewers, 6 sanitary sewers, 4 watermains, Lincoln, Aberdeen, Rexford, Knickerbocker and Cahoon Rds., from Cooper Constr. Co., 24409 Bruce St., vitrified **$69,606,** concrete **$65,875.** Est. $70,000. D. O. Glendenning, c/o owner, engr.

Tex., Levelland — City, May 18, sanitary sewerage sys. imprvs., extens., from Fischer's Frank Burcher Co., 203 Frederick Rd., San Antonio, **$160,219.** CD 4/25—ENR 5/5.

Tex., Waco—City, City Hall, May 17, sanitary sewerage sys. imprvs., from Roger Smith, Waco, **$35,131,** materials **$24,000.** CD 5/3—ENR 5/5.

CONTRACTS AWARDED

Fla., Chattahoochee—State Imprvt. Comn., Caldwell Bldg., Tallahassee, sewage disposal plant addns., Florida State Hospital, to J. H. Craggs, Constr. Co., Box 22, Gainesville, **$104,710.**

Ky., Louisville—Louisville & Jefferson Co. Metropolitan Sewer Dist., 310 City Hall Annex, Virginia Ave. Relief Sewers and Hale-Sunset Ave. Relief Sewers, Contr. 75, to Charles E. Cannell Co., 2138 S. Floyd St., **$84,637.** Bids 5/12, awarded 4/19. CD 4/4.

Pa., Darby—Gulf Oil Corp., 30 St. and Penrose Ave., Phila., sewer separator, overflow box, levee for waste oil tank, etc., to Hughes Foulkrod Co., 1505 Race St., Phila., Approx. **$50,000.** Bids 5/2. CD 4/27—ENR 5/5.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

May 31
North Carolina
June 1
Maine
June 3
Missouri
Washington
June 7
Oklahoma

June 8
New York
June 9
New Jersey
June 10
Pennsylvania
June 15
California
Louisiana

June 6

Ont., Ayton—Normanby Twp., H. J. Henderson, clk., Ayton, 3 span rein-con. bridge over Saugeen River, Concession 16, lot 6, incl. excavation in channel and approach fill. Approx. $135,000. Plans deposit $25. C. C. Parker, 63 John St. S., Hamilton, engr.

June 22

✝**Ind., Indianapolis** — U. S. Eng., 830 W. Broadway, Louisville, Ky., flood protection, Fall Creek Sect., 10 St. Bridge, incl. removal east abutment of steel truss bridge over White River, two 155 ft. steel truss spans extens., $400,000-$600,000. Plans deposit $10. CD 3/18—ENR 4/14.

LOW BIDDERS

Illinois—State Hy. Dpt., Springfield, May 20, bridge on Ill. Rt. 443, McDonough Co., from McCann & Co., 1708 S. Lincoln Ave., Springfield, **$68,903*****substructure paved approaches, steel for bridge on Ill. Rt. 1, from Traylor Bros. Inc., Station B, Box 66, Evansville, Ind., **$122,881*****structural steel, metal handrail hy. bridge on Ill. Rt. 1, from Allied structural Steel Co., 20 N. Wacker Dr., Chicago, **$76,730,** both White Co. CD 5/12.

Mass., Boston—Mystic Bridge Auth., 6 Beacon St., May 16, reconstruct Water St. Underpass, Mystic River Bridge, Charlestown and Chelsea, Contr. XII, from Farina Bros. Inc., 61 Bridge St., Newton, **$88,655.** CD 5/9.

Que., Montreal—Municipality, May 17, reconstructing concrete, steel, viaduct over tracks Canadian Pacific RR., Ste. Catherine St. E., from Charles Duranceau Ltd., 2545 Jacques Hertel St., **$508,200.** CD 4/13—ENR 4/21.

CONTRACTS AWARDED

Oregon—State Hy. Comn., Salem, 2 rein.-con. bridges and 0.57 mi. highway roadbed on Coos Bay Roseburg Hy., Coos Co., to Vadair Constr. Co., Builders Exchange Bldg., Portland, Zone 4, **$109,498.** R. H. Baldock, c/o owner, engr. Bids 5/16.

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

•May 31
Indiana
North Carolina
June 3
Kansas
Minnesota
Missouri
Washington
June 7
Kansas

June 8
California
New York
June 9
Pennsylvania
June 15
California
Louisiana
June 16
California

June 3

O., Youngstown—J. Emerson Davis, dir. Finance, Youngstown, paving Miller St. from South Ave. to Out Lot 1184

June 7

†California—Public Roads Admin., Phelan Bldg., San Francisco, hy. imprv. 3.298 mi. Calif. FH-90-B, Western Divide, Sequoia National Forest, Tulare Co. Plans deposit $10. C. C. Morris, Phelan Bldg., San Francisco, div. engr.

Miss., Winona—City, Winona, street paving.

June 8

†Colorado—Pub. Rds. Admin., 254 New Customhouse, Denver.

Montezuma Co.—imprv. 4.129 mi. Dolores-Rico, Colo. Forest Proj. 1-El. B. W. Matteson, div. engr. CD 3/29—ENR 4/14.

LOW BIDDERS

†California—Public Roads Admin., Phelan Bldg., San Francisco, May 17. 3,887 mi. hy. imprv., Calif. FH-48-B1, Huntington Lake, Sierra National Forest, Fresno Co., from C. G. Willis & Sons, 2119 E. 24 St., Los Angeles, **$396,809.** CD 5/2—ENR 5/5.

†California—Pub. Rds. Admin., Phelan Bldg., San Francisco, hy. imprvs. 3.435 mi. Tahoe-Brockway, Tahoe National Forest, Placer Co., from Fredrickson Bros., 1259 65 st., Emeryville, **$227,113.** CD 5/6.

Calif., Brea-La Habra—Orange Co. Courthouse, Santa Ana, May 17, imprv. Central Ave., Valley Home Ave. to Brea Canyon Rd., from O'Brien & Bell, 1414 S. Main St., Santa Ana, **$117,344.** CD 2/16—ENR 3/3.

Calif., Los Angeles—Los Angeles Co., 501 Hall of Records, May 17, imprv. Slauson and Garfield Aves., Bell Gardens, from L. C. Nappe, 1201 N. Keystone St., Burbank, **$113,180.** CD 4/5.

Calif., San Diego—City, Civic Center, Bldg., May 17, imprv. 39 St. and Quail St., from Daley Corp., P. O. Box 67, North Park Station, **$185,389,** est. $176,796; Ventura Blvd., Midway Dr to Mission Blvd., from Griffith Co., Box G, Hillcrest Station, San Diego, **$128,000.**

†Colorado—Public Rds. Admin., 254 New Customhouse Bldg., Denver, May 18, road constr. 6,975 mi. on Loveland-Fremont Pass, Colo Forest Proj. 33-A 1 and A2, Loveland-Fremont Pass, Summit Co., from Platt Rogers, Pueblo, **$358,959.** CD 5/9—ENR 5/12.

●Illinois—State Hy. Dpt., Springfield, May 20, concrete patching Ill. Rts. 130, 15, and U. S. 12 and 45, Clay, Richland, Lawrence, Wayne, Edwards and Wabash Counties, and concrete patching Ill. Rts. 14, 15, 37 and U. S. Rt. 460, Jefferson, Hamilton, Marion, Wayne and White Counties, from Regenhardt Constr. Co., Cape Girardeau, Mo., **$217,947** and **$141,804** respectively***concrete patching U. S. Rts. 51, 40, 45 and Ill. Rts 33 and 37, Fayette, Marion, Cumberland, Effingham, Coles, Jasper, and Shelby Counties, from C. J. Moritz, Inc., Register Bldg., Effingham, **$239,820*****bit. resurf. 11.72 mi. U. S. Rt. 34, Henry Co., from Central Engrg. Co., 2531 Rockingham Rd., Davenport, Ia., **$468,801*****bit. surf. tr. on grav. or creosoted stone base course, 33.33 mi. Ill. Rts. 127, 2, 857, 915, 919 and 150, Jackson, Union and Randolph Counties, from Bituminous Fuel & Oil Co., 509 First National Bank Bldg., East St. Louis, **$455,636*****bit. resurf. 3.8 mi. Ill. Rt. 25, Kane Co., from Geneva Constr. Co., 303 Old Indiana National Bank Bldg., Aurora, **$125,857*****bit. resurf. 6.1 mi. U. S. Rt. 150, Knox and Henry Counties, from H. H. Gunther Constr. Co., 600 E. Main St., Galesburg, **$234,160*****bit. resurf. 5.17 mi. Ill. Rt. 42A, from Peter Baker & Son, 1190 Conway Rd., Lake Forest, **$207,676*****bit. resurf. 4.07 mi. Ill. Rt. 42A from Skokie Valley Asph. Co., 1228 Harding Ave., Des Plaines, **$156,654,** both Lake Co.***bit. resurf. and concrete pavement wid'n. 0.81 mi. Ill. Rt. 142, Marion Co., from Trinidad Asphalt Mfg. Co., 600 St. Theresa St., St. Louis, Mo., **$84,321** ***grav. or crushed stone surf. course 5.43 mi. Ill. Rt. 379, from C. L. Swards & Son, 107 S. Jefferson St., Peoria, **$111,803*****bit. resurf. and concrete wid'n. Ill. Rt. 88 and concrete pavement, bit. resurf. 1.35 mi. U. S. Rt. 150, from Seneca Petroleum Co., 439 W. 33 St., Chicago, and S. M. H. Constr. Co., 1500 N. Adams St., Peoria, Zone 3, **$564,700*****paving 1.14 mi. Ill. Rt. 172 and substructure and steel for railroad subway, from Clark Bros. Co., 309 S. Jefferson St., Peoria, **$614,736,** all foregoing Peoria Co.***bit. seal coat 9.85 mi. Ill. Rt. 49, bit. resurf. 5.35 mi. Ill. Rt. 49, Vermilion and Iroquois Counties, from Gallagher Asphalt Co., 181 St. and Indiana Ave., Thornton, **$117,782.** CD 5/12.

Md., Baltimore—Mayor & City Council, City Hall, May 18, c. conc. streets, Contr. 979, from John P. Reddington & Sons, 2 E. Lexington St., **$70,699.** CD 5/13***sheet asph. resurf. streets, Contr. 976, from Mahoney Bros., 21 Knickerbocker Bldg., **$159,421***** sheet asph. resurf. streets, Contr. 980, from National Paving & Contg. Co., 4200 Menlo Dr., **$128,176.** CD 5/11—ENR 5/19.

●Massachusetts—Commonwealth of Massachusetts, Dpt. P. Wks., 100 Nashua St., Boston, May 17, hy. and bridge reconstruction, Danvers, from Central Constr. Co., 6 Beacon Ave., Lawrence, **$1,528,785.** CD 5/4—ENR 5/12; hy. and bridge, Brookside Rd., Great Barrington, from The Henley-Lundgren Co., 193 Hartford Pike, Shrewsbury, **$125,373.** CD 5/11.

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NEWNAN, GA.

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TOWERS
CYLINDERS
VESSELS
TANKS

CONTRACTS AWARDED

Ala., Homewood—City, street paving, to Southern Amiesite Asphalt Co., 2401 5 Ave. N., Birmingham, **$98,270.** Bids 5/18. CD 5/5.

Calif., San Jose—Santa Clara Co., Courthouse, imprv. streets, sewers, etc. in Stanford University Villa Tract, to Leo F. Piazza, 175 S. Montgomery St., **$99,231.** Bids 5/16.

†Idaho—P. Rds. Admin., P. O. Box 1559, Boise, surf., bit. surf. 17.232 mi. Priest River Rd., Kaniksu National Forest Proj. 6-G and H, Unit 2, Bonner Co., to Carbon Bros., P. O. Box 5025, Spokane, Wash., **$149,296.** Bids 5/19. CD 5/10—ENR 5/12.

Minn., Caledonia—Village, Village Hall, curb, Gutter, grading, surf. streets, to Hector Constr. Co., Box 107, **$133,766.** Bids 5/12. CD 5/3—ENR 5/5.

Minn., St. Paul—City, G. M. Shepard, engr., City Hall, monolithic concrete and cement tile sidewalks and curb, to Keogh Contg. Co., 617 Dayton Ave., **$116,599.** Bids 4/26. CD 4/20.

Oregon—State Hy Comn., Salem, reoiling secondary highways, Washington Co., to Harr & Horton, Builders Exchange Bldg., Portland, **$56,081.** R. H. Baldock, c/o owner, engr. Bids 5/17.

Que., Montreal—Municipality, permanent paving, sidewalks, De Bordeaux, Waverley, De Port Royall, Des Erables Sts., Old Orchard and Louis Hebert Lanes, to Miron Constr. Ltd., 170 Jarry St., **$77,313*****permanent sidewalks, Tenth and Sicard Aves., Theodore St., to H. J. O'Connell Ltd., Canada Cement Bldg., **$74,346*****permanent paving, sidewalks, Plamondon, Trans Island, Walkley, Ridgevale, Benny and McLynn Aves., MacKenzie, Birnam Sts., and Des Marchais Blvd., to Charles Duranceau Ltd., 2545 Jacques Hertel St., **$176,274.** Grand total $327,933. CD 4/13.

EARTHWORK, WATERWAYS

BIDS ASKED

June 2

†Idaho—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., 35,000 bbl. portland cement in bulk, Anderson Ranch Dam and Power Plant, Spec. 2685, Boise Proj. L. N. McClellan, ch. engr.

June 7

†California—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., 9 distr. boards, 1 distr. panel board, one 125 volt battery control and distr. board, two 10-kw. battery chargers, 2 fire-control cabinet assemblies, two 150 kva. and one 75 kva. transformers, 20 thermostats, 3 pressure temperature switches for Tracy Pumping Plant and Switchyard, Central Valley Proj., Spec. 2642. Extended date. CD 4/10—ENR 4/21.

June 15

†Louisiana—U. S. Eng., foot of Prytania St., New Orleans, Zone 9, earth chamber for Bayou Sorrel Lock, Iberville Parish, Serial No. Eng. 16-047-49-210.

†Michigan—U. S. Eng., 609 Federal Bldg., Detroit, Zone 31, flood protection works, incl. excav. cut off canal and concrete weirs and appurtenant structures, from point in Clinton River, at southerly limit of Mount Clemens, approx. 1,500 ft. below Gratiot Ave. bridge, southeastward to Lake St. Clair, Serial No. Eng. 20-064-49-83. CD 1/11—ENR 1/13, under LB.

June 16

†Louisiana—U. S. Eng., foot Prytania St., New Orleans, Zone 9, Reaches 1, 2 and 3, Jonesville Floodwall, Catahoula Parish, Serial No. Eng. 16-047-49-283.

June 21

†Montana—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f. o. b. cars shipping point or f. o. b. cars Louisville, 1 hydraulic hoist elevator and 1 lot servicing equip., 1 transfer car for 77 in. regulating gate in river outlets at Canyon Ferry Dam, Canyon Ferry Unit, Missouri River Basin Proj., Spec. 2683. L. N. McClellan, ch. engr. CD 9/5/45—ENR 9/13/45.

†New York—U. S. Eng., Engineer Park, Buffalo, Zone 7, Onondaga Creek Channel Imprvs., Syracuse, Onondaga Co., Serial No. Eng-30-023-49-54. CD 5/23.

†Washington—Bureau Reclamation; Dpt Interior, Prosser Irrigation Dist., Prosser, rehabilitation pump discharge and siphon lines from 2 to 8 mi. northeasterly from Prosser, Spec. R1-46.

June 22

†Illinois—U. S. Eng., 830 W. Broadway, Louisville, 3, Ky., flood protection vicinity Reevesville, Reevesville, Reevesville and Cache River Levees, Serial No. Eng. 15-029-49-145 and 15-029-49-151.

June 23

†Illinois—U. S. Eng., 830 W. Broadway, Louisville, Ky., flood protection Mounds and Mound City, Cache River Diversion, Unit 2B, $700,000-$900,000. Plans deposit $10.

June 24

●†Ky., Louisville—U. S. Eng., 830 W. Broadway, Louisville, flood protection, Sect. A, Part 1, incl. levee embankment concrete floodwall closures, and storage vaults, sewers, and drains, sluice gates, steel sheet piling, fertilizing and seeding, replacing pavement and railroad tracks, Serial No. Eng. 15-029-47-144. $2,000,000-$3,000,000. Plans deposit $25.

About July 14

†North Dakota—U. S. Eng., Fort Lincoln, P. O. Box 300, Bismarck, intake structure for Garrison Dam and Reservoir, Riverdale, Serial No. Eng-32-015-49-94. CD 6/1/44—ENR 6/15/44.

On or About August 9

†South Dakota—U. S. Eng., 1709 Jackson St., Omaha 2, Neb., furnishing intake gates for Fort Randall Reservoir Proj. Picktown, Spec. No. Eng-25-068-49-253. Plans deposit $10.

LOW BIDDERS

Ind., Liberty—State of Indiana, Dpt. P. Wks., W R. Mybeck, dir., State House, Indianapolis, May 20, concrete and earthwork dam across Silver Creek to create 200 acre lake, White Water State Park, near here, from F. N. Bunzendahl, Connersville, **$160,531.** Est. $120,000. CD 5/11.

†Louisiana—U. S. Eng., foot Prytania St., New Orleans, Zone 9, May 17, approx. 3,900 lin. ft. pile dikes, Red River, Serial No. Eng. 16-047-49-292, from Pine Bluff Sand & Gravel Co., foot Nebraska St., Pine Bluff, Ark., **$195,950.** CD 5/4.

Mass., Worcester—City, P. Wks., E. R. Perry, comr., City Hall, May 16, covering Beaver Brook between Chandler and May Sts., from Berger Metal Culvert Co. of New England, 440 Somerville Ave., Somerville, **$105,157.** CD 5/11.

●New York—Bureau Contracts & Accounts, Albany, rejected bids Mar. 23, guard gates and spillway at Mohawk and guard gates and widening short sect. canal at Little Falls, both Herkimer Co., L. B. **$1,199,032** and **$592,000** respectively. CD 3/25—ENR 3/31, under LB.

CONTRACTS AWARDED

●†Florida—U. S. Eng., P. O. Box 1169, Mobile, 7, Ala., navigation lock and fixed crest spillway at Jim Woodruff Dam, Chattahoochee, Serial No. Eng-01-076-49-106, to B. Perini & Sons, Inc., 73 Montwait St., Framingham, Mass., Walsh Constr. Co., 114½ W. 3 St., Davenport, Ia., Ralph E. Mills Co., 410 Ann St., Frankfort Ky. and Blythe Bros. Co., 2911 Hutchinson Ave., Charlotte, N. C., **$8,714,972.** CD 5/11—ENR 5/19, under LB.

●†Ky., Newport—U. S. Eng., 830 W. Broadway, Louisville, flood protection, Sect. 2, Part 1, Serial No. Eng. 15-029-49-122, to Traylor Bros., Inc., Station B, Box 66, Evansville, Ind., **$1,220,370.** Bids 4/26, awarded 5/4. CD 4/29—ENR 5/5, under LB.

†Minn., Minneapolis—U. S. Eng., 1217 U. S. Post Office and Custom House, St. Paul, Zone 1, lower approach dredging Lower L/D Stage No. 2, approx. 277,000 cu. yd. excav. Mississippi River, St. Anthony Falls, Serial No. Eng. 21-018-49-82, to Dunbar & Sullivan Dredging Co., 2312 Buhl Bldg., Detroit, 26, Mich., **$689,730.** Bids 4/26, awarded 5/6. CD 5/3—ENR 5/5, under LB.

AIRPORTS AND AIRBASES

BIDS ASKED

June 1

†Va., Chincoteague—EROSION CONTROL—Pub. Wks. Office, Fifth Naval Dist., U. S. Naval Dist., U. S. Naval Base, Norfolk 11, erosion control at the Naval Auxiliary Air Station, Spec. 22650. Plans deposit $10.

June 7

†Tex., Dallas — AIRPORT — U. S. Eng., 606 Santa Fe Bldg., Galveston, remedial work on Hensley Field Air Base pavements, cleaning and resealing runways, taxiways, aprons, 560,000 lin. ft. joints and cracks, Inv. No. Eng-41-243-49-316. $75,000.

June 30

Tex., Houston—AIRPORT—City, M. H. Westerman, secy., City Hall, 900 Brazos St., 1,000 ft. addn. to east end of EW runway and northeast end of northeast-southwest runway, at Municipal Airport. $220,000. J. M. Nagle, c/o owner, engr. CD 7/31/46—ENR 8/22/46.

August 28

Tex., Houston — DRAINAGE — City, M. H. Westerman, secy., City Hall, 900 Brazos St., airport drainage, 360 acre tract. $970,000. J. M. Nagle, c/o owner, engr. CD 7/31/46—ENR 8/22/46.

Proposal Advertisements see pp. 154 to 157
Proposed Projects see p. 112

SEARCHLIGHT SECTION

AN AUCTION
HEAVY CONSTRUCTION EQUIPMENT
TUES., JUNE 7th, 10 A.M.

Located at Republican City, Nebr., a complete dirt moving outfit each piece just 2 years old, used on only 1 dirt moving job. #362 Marion 1½ cu yd shovel a 1¾ cu yd dragline combination, 50' boom, 10' ext, 1¾ yd Page bucket, light plant, 33" crawler shoes, 2377 hours like new; 4-D8 Caterpillar Diesel tractors, LeTourneau dozer & angledozer, Cat dozer, & 1 with light system & front pull hook, about 2500 hours each; #12 Cat Motor grader, 2802 hrs; 10 Euclids, 6 with Cummins Diesel & 4 with GM Diesel engines, 13 cu yds, Models 58WG & 58W, 1350 to 2400 hrs; Cat 4E elevating grader, 2802 hrs; 2 #3 Dixson bottom dump wagons, 18-20 cu yds, adapted to Terra Cobra tractor units, 150 hrs; 2 Wooldridge Terra Cobra Tractor & Scraper units, 150 hp Cummins Diesel engines, 835 & 1104 hrs; 6 trucks; light plants, welders, generators, pumps, Hyster Winch for D8, repair parts, tools and many other items. Each piece is in A-1 condition ready to be put right on the job, write or wire auctioneers for complete sale bill. Each piece positively sells to highest bidder.

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FORKE BROS. & FICKE,
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U. S. Government

NORTH PLATTE RIVER DISTRICT
Design Unit, Casper, Wyoming
May 16, 1946
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

NOTICE IS HEREBY GIVEN that sealed bids will be received at Casper, Wyoming, until 10:00 a.m., Mountain Standard Time, June 3, 1949, and then publicly opened, for furnishing labor and materials and performing all work for the earthwork, concrete lateral lining, and construction of structures, station 130+18.6 to station 172+69.5, Lateral 90.4, Soil and Moisture Conservation Program, North Platte Project, Nebraska-Wyoming. The work is situated near Lyman, Nebraska. The principal items of work and the estimated quantities involved are as follows: 4,200 lineal feet—Filling, excavating and shaping canal. 2,155 cubic yards—Borrow excavation. 4,226 lineal feet—Concrete lining. 6 cubic yards—Concrete in structures. 650 pounds—Furnishing and placing reinforcement steel. 15 square feet—Furnishing and placing elastic filler material in joint. Copies of the standard forms and of the specifications may be obtained from the following office of the Bureau of Reclamation: I. J. Matthews, District Manager, 504 Conroy Building, Casper, Wyoming. No charge to prospective bidders for copies of the specifications and drawings; to others $1.00 per copy, not returnable.

MICHAEL W. STRAUS, Commissioner
(160)

(Continued on page 156)

CONTRACTORS
WATCH
THIS SECTION
for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

OFFICIAL PROPOSALS

(Continued from page 154)

Bids: June 1, 1949 (123)

Electric Traveling Cranes

CONTRACT 397

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 10:00 A. M., Eastern Standard Time, on Wednesday, June 1, 1949, for Contract 397, for furnishing, testing and delivering one 5-ton and three 3-ton electric traveling cranes and appurtenances for the Rondout, West Branch and Kensico South effluent chambers of the Delaware aqueduct, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York, in the amount of one thousand five hundred dollars ($1,500.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained at the office of the Chief Engineer, **Room 1311, at the above address**, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President. HENRY HESTERBERG, RUFUS E. McGAHEN, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

Bids: June 8, 1949 (158)

Paving a Portion of 134th Street

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT NYA-91

Sealed proposals for paving of portion of 134th Street at New York International Airport, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:00 P.M. Wednesday, June 8, 1949, and thereafter in the Auditorium of the Authority at the same address until 2:30 P.M., on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer, and copies will be furnished upon deposit of $25.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of the proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman.

New York, May 26, 1949.

Bids: June 15, 1949 (159)

Cancellation of Advertisement

DEPARTMENT OF PUBLIC WORKS,
BUREAU OF WATER
CONTRACT NO. 126-WWI

Construction of Preliminary Treatment Plant and Appurtenances at Queen Lane Filter Plant

Advertisement for sealed proposals for Construction of Preliminary Treatment Plant and Appurtenances, at the Queen Lane Filter Plant, to be received until 12 o'clock Noon, Eastern Daylight Saving Time, Wednesday, June 15, 1949, IS HEREBY CANCELLED.

Request is hereby made for the immediate return of all Plans, Specifications, Forms of Proposal and Contract to the Office of the Bureau of Water, Room 819 City Hall Annex, obtained by prospective contractors. Deposit in the amount of Twenty-five ($25) Dollars will be refunded upon receipt of the Plans and Specifications in good condition.

THOMAS BUCKLEY, Director

OFFICIAL PROPOSALS

Bids: June 9, 1949 (157)

Grade Crossing Eliminations

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

WALNUT & LEXINGTON AVE. (L.V.R.R.) GRADE CROSSING ELIMINATIONS
Elimination of Walnut and Lexington Avenue Grade Crossings over the Lehigh Valley Railroad, in Cranford Township, Union County, Federal Aid Grade Crossing Project FAGS-68(1).

Estimated:	956	cu. yds. Class "B" and "C" Concrete
	394,000	lbs. Structural Steel
	62,200	lbs. Reinforcement Steel
	27,739	cu. yds. Roadway Excavation-Earth
	18,742	cu. yds. Roadway Excavation-Rock
	12,568	sq. yds. 5" Macadam Base Course
	12,568	sq. yds. 2" Mod. Pen. Macadam
	1,383	tons Pavement, Type "A" or "T"

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, New Jersey, on Thursday, June 9, 1949, at ten o'clock (10:00 A.M.-EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.-DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Grade Crossing Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and Supplements and by Section 5 of the Federal Act of September 5, 1940 (Public 780-76th Congress) and is to be performed in accordance with the special provisions and requirements of the Federal Works Agency, Public Roads Administration, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 268 N. Broad Street, Elizabeth, N. J. The attention of bidders is dnrected to the special provisions covering subletting or assigning the contract. The minimum wage paid to all unskilled labor employed on this project shall be 65¢ per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be 75¢ per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.25 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

U. S. Government

GOVERNMENT OF THE DISTRICT OF COLUMBIA, DIRECTOR OF SANITARY ENGINEERING, D. C., May 21, 1949. SEALED PROPOSALS will be received in Room 509, District Building, 14th Street and Pennsylvania Avenue, N. W., Washington 4, D. C., until 2:00 P.M., DAYLIGHT SAVING TIME, June 13, 1949, and then publicly opened and read for the construction of the Emerson Street Storm Sewer, Section 2, and South Dakota Avenue Sanitary Sewer. This project consists of 4,170 lin. ft of 6'3" to 18'0" x 7'3" diameter reinforced concrete and brick masonry; 1,840 lin. ft. of 2'0" x 3'0" to 5'0" diameter concrete and brick masonry; 50 lin. ft. of 4'0" and 3'0" diameter reinforced concrete pipe; 4,470 lin. ft. of 12" to 24" diameter terra cotta pipe; and 157 lin. ft. of junction chamber and transition section. Proposal forms, plans and specifications may be obtained in Room 427, District Building (Telephone National 6000, Extension 2378). (161)

OFFICIAL PROPOSALS

Bids: June 22, 1949 (147)

Auditorium

ONONDAGA COUNTY WAR MEMORIAL AUDITORIUM

Syracuse, New York

SEALED PROPOSALS will be received until 2 P.M., E.D.T. Wednesday, June 22, 1949, by R. W. Sollinger, County Purchasing Agent in Room 107 at Court House, Syracuse, N. Y., at which time they will be publicly opened and read in Supervisors Chambers on Fourth Floor; for a multipurpose auditorium building of 9,000 seating capacity, located in the City of Syracuse, New York.

Proposals will be received separately on General Construction with Arch-rib concrete roof structure; Plumbing; Heating; Ventilation; Refrigeration and Rink Piping; Electrical.

Information for Bidders, Plans and Specifications may be examined in the offices of the County Purchasing Agent, or Edgarton and Edgarton, Architect-Engineer Associates, 401 Herald Building, Syracuse, N. Y., or Syracuse Builders' Exchange, 207 James Street, Syracuse 2, New York. General information pertaining to the design of the concrete arch roof structure may also be obtained from Ammann and Whitney, Consulting Engineers, 76 Ninth Avenue, New York, 11, N. Y. Information pertaining to Mechanical and Electrical Work may be obtained from Robson & Woese, Inc., 2030 Erie Blvd. E., Syracuse, New York.

One set of General Construction Drawings and Specifications are obtainable from the County Purchasing Agent by General Contractors by depositing $50.00. One set of each Mechanical or Electrical Drawings and Specifications are obtainable from the County Purchasing Agent by Mechanical or Electrical Contractors by depositing $15.00 for each set. Any sets in addition to the above are obtainable by prime bidders by paying $30.00 per set of General Construction and $10.00 per set for each Mechanical or Electrical. The $50.00 and $15.00 deposit for the initial sets will be refunded upon return of the Drawings and Specifications, in good condition, within one week after bid opening date. The $30.00 and $10.00 payments for additional sets will not be refunded. Other than prime bidders shall buy plans and specifications from the Architect-Engineer without refund.

The right is reserved to reject any or all bids.

Dated, Syracuse, N. Y., May 11, 1949.
ROBERT W. SOLLINGER
County Purchasing Agent
107 Court House
Syracuse, N. Y.

"Opportunity" Advertising:
Think
"SEARCHLIGHT"
First

OFFICIAL PROPOSALS
(Continued from page 155)

Bids: June 8, 1949 (156)

State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Chapter 63 Laws of 1936, as amended, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time on June 8th, 1949 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for

the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract containing 1 to 15 sheets is $5.00; 16 to 30 sheets, $10.00; over 30 sheets, $20.00. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1 G. L. Nickerson, Dist. Engr., 353 Broadway, Albany, N. Y.						
Schenectady	PSC 6630	Elim. N. Y. C. R. R. with Rotterdam Junction-Pattersonville, S. H. 640	0.35	Conc. 8″ Thk., 22′-44′ Girder 116′-2″ c to c Bearings. 19′ Pedestrian Subway.	$28,000 Plans $10.00	$487,000
DISTRICT No. 2 L. Ketchum, Dist. Engr., 109 No. Genesee St., Utica, N. Y.						
Madison	RC 49-62	Lakeport-Oneida Lake, S. H. 1022 Bridgeport-Lakeport, S. H. 962	7.98	Asphalt Conc. Optional	$16,000 Plans $5.00	$274,000
DISTRICT No. 3 Wm. Robinson, Dist. Engr., 301 E. Water St., Syracuse, N. Y.						
Onondaga	FC 49-1	Onondaga Indian Reservation Roads	1.23	Asphalt Conc. Optional	$11,000 Plans $5.00	$190,000
DISTRICT No. 4 A. R. Mulligan, Dist. Engr., Barge Canal Terminal, Rochester, N. Y.						
Genesee	RC 49-57	Alexander-Canawaugus, Pt. 3, S. H. 450	0.21	Roadside Development	$1,000 Plans $5.00	$18,200
Ontario	RC 49-58	Woodville-Bristol Springs, S. H. 156	0.57	Roadside Development	$700 Plans $5.00	$12,500
DISTRICT No. 5 C. R. Waters, Dist. Engr., 65 Court St., Buffalo, N. Y.						
Cattaraugus	RC 49-61	Salamanca-Ellicottville, Pt. 2, S. H. 1509	0.48	Conc. Slab, 22′, 24′, Asph. Conc. Optional	$5,000 Plans $5.00	$98,000
Erie	FASS 49-15	East Church St., Co. Rd., 488, Proj. S248(1)	0.38	Steel Arch 144′ I-Beams 28′, 36′, 40′ Asph. Conc. Optional	$12,000 Plans $5.00	$204,000
Erie	GISP 49-1	Grand Island State Parkway (West River Parkway)	4.75	2 Cres. Conc. 8″ Thk.	$75,000 Plans $20.00	$1,314,000
DISTRICT No. 6 H. F. Brumm, Dist. Engr., 30 West Main St., Hornell, N. Y.						
Chemung	RC 49-56	Horseheads-Montour Falls, S. H. 5208	2.13	Asph. Conc. Optional	$3,500 Plans $5.00	$63,000
Steuben	FAC 49-3 FARC 49-63	Corning City Denison Pkwy. Ext. Big Flats-Gibson, S. H. 742, Proj. U225(6)	0.28	Paving Deck Conc. 2 at 25′	$29,000 Plans $5.00	$497,000
Steuben	FASS 49-17	Arkport-Bishopville (Co. Rd. 67), Proj. S321(1)	0.06	Conc. Slab 35′ Asph. Conc. Optional	$2,000 Plans $5.00	$39,000
DISTRICT No. 7 R. F. Hall, Dist. Engr., 444 Van Duzee St., Watertown, N. Y.						
Franklin	FAS SH49-10	Bangor-Malone, Proj. S305(1)	5.16	Conc. Slab 25′ Asph. Conc. Optional	$35,000 Plans $10.00	$586,000
Clinton	RC 49-16	Elsinore-Dannemora, S. H. 8346,1859, Pts. 1 & 2	4.88	Asph. Conc. Optional	$7,000 Plans $5.00	$137,000
DISTRICT No. 8 J. S. Bixby, Dist. Engr., Pleasant Valley Rd., Poughkeepsie, N. Y.						
Putnam	RC 49-59	Brewster-Carmel, S. H. 909	1.86	Asph. Conc. Optional	$3,000 Plans $5.00	$52,000
Westchester	RC 49-60	White Plains-Rye Lake, S. H. 5226	1.10	Asph. Conc. Optional	$3,000 Plans $5.00	$57,000
Westchester	PSC 5969	Elimi of Grade Crossing N. Y. C. Railroad with Broadway & Cross Sts. at Hawthorn	0.46 0.46	Asph. Conc. Optional Plate Girder 82′ Span Triple Span Pl. Grd. 214 88′ Total Span	$60,000 Plans $20.00	$1,034,000
Westchester	CCP 49-1	Cross County Parkway to Hutchinson Parkway (Wartburg Conn.)	0.58	Elip. Arch 50′ 7¾″ Span Conc. Arch 53′ 10″ Span Conc. 8″ Thk., 24′ 12′ Var. Wdt. Rigid Fr. 87′ 6″	$90,000 Plans $10.00	$1,548,000
Westchester	FGRC 49-51 FARC 49-52	Sep. of Grades N. Y. C. R. R. with S. H. 1324 Whitehall Cors.-Wrights Cors. Proj. FG643(11); F643(11)	0.58	Rigid Fr. 40′, 50′, 60′ I-Beams (Alpha) 90′ ($219.10) Conc. 8″ Thk., 22′-48′ Wdt.	$25,000 Plans $5.00	$434,000
Ulster	PSC 4781	City of Kingston, Broadway		Demolition of Bldgs.	$1,500 Plans $5.00	$28,000
DISTRICT 10 J. J. Darcy, Dist. Engr., Montauk Hwy. at Little E. Neck Rd., Babylon, L. I., N. Y.						
Bronx	FA MDE49-2	Major Deegan Expressway (Cont. 2) Proj. U1082(4) (East 157th St.)	0.30	Conc. & Steel Viaduct Conc. 9″ 2 at 36′	$190,000 Plans $20.00	$3,486,000

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: May 31, 1949 (135)

Water Works System

NOTICE TO CONTRACTORS
EXTENSION NO. 3 TO
ROTTERDAM WATER DISTRICT NO. 1,
ROTTERDAM, NEW YORK

Sealed bids for the construction of a water works system will be received by the Board of Water Commissioners in the Assembly Hall on the top floor of the Town Hall on Vinewood Avenue in the Town of Rotterdam, Schenectady County, New York, until 8:00 P.M., Eastern Daylight Saving Time, May 31, 1949, and then at said rooms publicly opened and read aloud.

The Information for Bidders, Form of Contract, Plans, Specifications and Form of Performance Bond may be examined at the office of the Town Clerk in the Town Hall on Vinewood Avenue, Town of Rotterdam, New York and at the office of Keis & Holroyd, Consulting Engineers, 257 Broadway, Troy, New York. Copies thereof may be obtained at the said office of Keis & Holroyd upon payment of $25.00 for each set. Any bidder upon returning such set in good condition, will be refunded his payment and any non-bidder upon so returning such set promptly will be refunded $20.00.

The Board of Water Commissioners, Rotterdam Water District No. 1, Rotterdam, New York reserves the right to waive any informalities in, or to reject, any or all bids.

A certified check made payable to the order of the Board of Water Commissioners of Rotterdam Water District No. 1, Rotterdam, New York, in the amount of five per centum (5%) of the bid must be deposited by each bidder with his bid as a guarantee that in case the contract is awarded to him, that he will within 5 days thereafter, execute such contract and furnish a satisfactory performance bond. On failure to do so he shall forfeit the deposit as liquidated damages, and acceptance of the bid will be contingent upon the fulfillment of this requirement by the Bidder.

The successful Bidder will be required to furnish a performance bond satisfactory to the Board of Water Commissioners of Rotterdam Water District No. 1, Rotterdam, New York in the amount of the contract, and having as surety thereon such surety company or companies as are acceptable to the Board of Water Commissioners of Rotterdam Water District No. 1, Rotterdam, New York.

No bidder may withdraw his bid within 45 days after the date set for the opening thereof. Any bid may be withdrawn prior to the above scheduled time for opening of bids or authorized postponement thereof.

WILLIAM ELLERS
Secretary

Dated: May 2, 1949
KEIS & HOLROYD
CONSULTING ENGINEERS
TROY, NEW YORK

Bids: June 7, 1949 (154)

Strengthening & Repairing Approach of Span

LEGAL NOTICE
NOTICE TO CONTRACTORS

Sealed proposals addressed to the President and Trustees of the Village of Ossining for:

(1) Strengthening and repairs to East approach of Span of Secor Road Bridge, will be received at the office of the Village Clerk, in the Municipal Building, Ossining, N. Y., until eight o'clock P. M. prevailing time, on June 7, 1949 at which time they will be publicly opened, read and compared.

Copies of the plans, form of Proposal, Specifications, Bond and Contract may be obtained from the Village Clerk at his office, Municipal Building, Croton Avenue, Ossining, N. Y., upon deposit of Five ($5.00) Dollars which will be refunded upon the return of the plans in acceptable condition within fifteen days of the bidding date.

The right is reserved to reject any or all bids.

By order of the President and
Trustees, Village of Ossining, N. Y.
FREDERICK T. SCRIMA,
Village Clerk.

Dated: Ossining, N. Y.
May 5, 1949.

Bids: June 10, 1949 (155)

School Additions

Bids Asked June 10, 1949

Ohio—Cincinnati—Bd. of Educ. Bids to Clk. 216 E. 9th St.—Condon Sch and So. Avondale Sch Additions—Est Cost $1,000,000—plans & spec 511 W. Court St.—$25 deposit.

(Continued on page 157)

OFFICIAL PROPOSALS

(Continued from page 156)

Bids: June 1, 1949 (905)

Barge Canal Improvement

NOTICE TO BIDDERS

Sealed proposals in duplicate covering construction of

Contract—U. S. 37 Guard Gates, Spillway and performing other miscellaneous work at Herkimer (Mohawk) Herkimer County, N. Y.

Contract—U. S. 64 Guard Gates and performing other miscellaneous work at Little Falls, Herkimer County, N. Y.

will be received by Henry A. Cohen, Director, Bureau of Contracts and Accounts, Department of Public Works, The Governor Alfred E. Smith State Office Building, Albany, N. Y., on behalf of the Department of Public Works until 10:30 o'clock A. M. (Advanced Standard Time which is 9:30-o'clock A. M. Eastern Standard Time.) on Wednesday, June 1, 1949, when they will be publicly opened and read.

Each proposal must be made upon the form and submitted in the envelope provided therefor and shall be accompanied by a certified check made payable to the State of New York, Commissioner of Taxation and Finance, of 5% of the amount of the bid as a guaranty that the bidder will enter into the contract if it be awarded to him. The title of the work must be written on the front of the envelope, sealed and delivered to Henry A. Cohen, Director, Bureau of Contracts and Accounts, The Governor Alfred E. Smith State Office Building, Albany, N. Y. The blank spaces in the proposal must be filled in, and no change shall be made in the phraseology of the proposal. Proposals that carry any omissions, erasures, alterations or additions may be rejected as informal. Successful bidder will be required to give a bond conditioned for the faithful performance of the contract and a separate bond for the payment of laborers and material men. Corporations submitting proposals shall be authorized to do business in the State of New York. Drawings and specifications may be examined free of charge at the following offices:

OFFICIAL PROPOSALS

Guy W. Pinck, Deputy Chief Engineer, The Governor Alfred E. Smith State Office Building, Albany, N. Y.
State Architect, 18th Floor, 270 Broadway, New York City.
Lacy Ketchum, District Engineer, 109 N. Genesee St., Utica (1) N. Y.
Wm. Robinson, District Engineer, 301 E. Water St., Syracuse (1) N. Y.
A. R. Mulligan, District Engineer, Barge Canal Terminal, Rochester (1) N. Y.
Charles H. Waters, District Engineer, 65 Court St., Buffalo (2) N. Y.

Drawings and specifications may be obtained from the Director, Bureau of Contracts and Accounts, The Governor Alfred E. Smith State Office Building, Albany, New York, upon deposit of $10.00 for each set.

Refund in full will be made to bidders for one set of plans and specifications returned in good condition within 30 days of award of contract or the rejection of the bids. A 50% reimbursement will be made for the return in good condition, of all other sets of the plans and specifications **within 30 days following the award of the contract or the rejection of the bids.**

Checks for plans and specifications shall be made payable to the State of New York.

Proposal blanks and envelopes will be furnished without charge.

B. D. TALLAMY, Superintendent
N. Y. State Department of Public Works

U. S. Government

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS, Foot of Prytania Street, New Orleans, La.—Sealed bids will be received in this office until 11:00 a.m., CST, 17 June 1949, and then opened for the construction of Schooner Bayou Control Structure approximately 18 miles south of Abbeville in Vermilion Parish, La., New Orleans District. Principal quantities involved are approximately 40,000 cu. yds. excavation, 4,600 cu. yds. concrete, 6,800 bbls. cement, 600,000 lbs. steel reinforcement, 17,500 lbs. structural and miscellaneous metal, steel sector gates, operating machinery, and miscellaneous items. Further information on application.

MICHAEL W. STRAUS, Commissioner.
(144)

U. S. Government

GOVERNMENT OF THE DISTRICT OF COLUMBIA, DIRECTOR OF HIGHWAYS, D. C., MAY 13, 1949, SEALED PROPOSALS will be received in Room 509, District Building, 14th Street and Pennsylvania, N. W., Washington 4, D. C., until 2:00 P.M., DAYLIGHT SAVING TIME, June 3, 1949, and then publicly opened and read for the construction of the reinforced concrete bridge deck consisting of roadway and sidewalk slabs for the superstructure of the East 14th Street Bridge over the Potomac River. Approximate quantities of the major items are 4,200 cubic yards of class BB concrete and placing 646,170 pounds of fabricated reinforcing steel which has been purchased by the District of Columbia. The attention of bidders is directed to the required contract provisions covering sub-letting or assigning the contract and to the use of domestic materials. Attention of the bidders is particularly called to the requirements as to the conditions of employment to be observed and minimum wage rates to be paid under the contract. The Manager, U. S. Employment Service, for the District of Columbia is Mr. Robert A. Morrison, 503 'K' Street, N. W., Washington, D. C. Proposal form may be obtained in Room 427, District Building (Tel. National 6000, Extension 2378), upon deposit of a certified check in the amount of $25.00 made payable to the Collector of Taxes, D. C.

(152)

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS, Foot of Prytania Street, New Orleans, La.—Sealed bids will be received in this office until 11:00 a.m., CST, 9 June 1949, and then opened for the construction of the terrace section of Texarkana Dam, Bowie County, Texas, in the New Orleans District. Principal quantities involved are approximately 2,500,000 cubic yards of compacted fill, 137,000 cubic yards of dumped riprap, 55,000 cubic yards of filter gravel, the construction of 2 miles of road and a slope drainage system. Further information on application.

(111)

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED—ENGINEERS, Architects, Draftsmen experienced in the design of sewers, sewage treatment plants, water treatment plants and industrial buildings. Also engineers to supervise construction. State qualifications, experience, salary requirements and date available. P-1155, Engineering News-Record.

CHECKER-DETAILERS for Structural and misc. shop drawings. Permanent position. Hospitalization, health and accident insurance available. Vacations and holidays with pay. State education, experience, age, salary desired and when available. The J. T. Edwards Company, 1241 McKinley Avenue, Columbus 8, Ohio.

ESTIMATOR: EXPERIENCED quantity survey estimator and project manager wanted for permanent position in a growing organization. Give complete experience record and references. P-8894, Engineering News-Record.

WANTED—SPECIAL Machinery Salesman. Top proposition to men traveling out of town industries. Mechanical Machine & Tool Wks., Chicago 22, Ill.

WANTED IRRIGATION Engineer, with at least ten years experience in planning, designing and estimating distribution systems and drainage works and with basic knowledge of agronomy. U. S. engineering firm with initial assignment Near East. P-8917, Engineering News-Record.

POSITIONS VACANT

ENGINEERS: UNIVERSITY professors in all fields Master's and Doctor's qualify unusually fine positions $4500-7000 nine months. Instructors, bachelors. Give phone, photo, qualifications. Cline Teachers Agency, East Lansing, Mich.

CIVIL ENGINEERING; College teaching; New England. One position involves Strength of Materials, and Mechanics; some opportunity for developments in testing lab.; Master's desirable. Second position involves teaching in Sanitary Engineering along with Mechanics and Surveying; at least Master's degree. Instructor or assistant professor. P-9015, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT who has specialized on the placing of concrete. For a man who is thoroughly familiar with concrete plant, concrete, and form costs, etc., we have an exceptional opportunity. Give full particulars of experience and education. P-9018, Engineering News-Record.

(Continued on page 158)

SALARIED POSITIONS $3.500—$35.000

If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (39 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N.Y.

CIVIL ENGINEER
Wanted Immediately

To act as foreman for sewer, water main, utilities and underground conduit work. Must be thoroughly experienced to handle men and equipment. Live wire only need apply. Write to:

P-8998, Engineering News-Record
520 North Michigan Ave., Chicago 11, Ill.

ESTIMATOR

For underground power and telephone conduit work and gas main construction in greater Boston. Experience essential. Permanent position. Apply by letter only stating qualifications, experience, age, former employers, references, and salary required.

BOND BROS., INC.
77 Ferry Street Everett, Mass.

ENGINEERS WANTED:

PROJECT ENGINEER experienced in correlating the engineering of gasoline plants and natural gas compressor stations.
DESIGN ENGINEER experienced in the layout & design of petroleum refineries, Kansas City location. State qualifications.

P-9006, Engineering News-Record
520 North Michigan Ave., Chicago 11, Ill.

WANTED—SALES ENGINEER

To travel Midwest Area contacting Hwy. Engineers, selling and servicing Calcium Chloride. Salary, expenses and auto allowance. Sales experience and knowledge of roadbuilding desirable.

WYANDOTTE CHEMICALS CORP.,
Calcium Chloride Dept., Wyandotte, Mich.

Auction Advertising—page 154

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

(Not available for equipment advertising)

$1.20 cents a line, minimum 4 lines. To figure advance payment count 5 average words as a line.

INDIVIDUAL EMPLOYMENT WANTED undisplayed advertising rate is one-half of above rate, payable in advance.

PROPOSALS, $1.00 a line an insertion.

INFORMATION.

BOX NUMBERS care publication New York, Chicago or San Francisco offices count as 1 line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

The advertising rate is $11.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

NEW ADVERTISEMENTS received by June 1st appear in June 9th issue subject to limitation of space available

WANTED

ENGINEERS - ARCHITECTS - DRAFTSMEN

To prepare or approve drawings and specifications for Hospitals, Penal Institutions, Colleges, Universities, and other Public Works for the State of Maryland.

The following classifications are needed:

Architect	$6,000.	to	$7,500.	per year*
Structural Engineer	5,000.	to	6,250.	per year*
Civil Engineer I	5,000.	to	6,250.	per year*
Mechanical Engineer I	5,000.	to	6,250.	per year*
Mechanical—Electrical Engineer I	5,000.	to	6,250.	per year*
Mechanical—Electrical Engineer II	4,200.	to	5,250.	per year*
Architectural Draftsmen	3,300.			
Architectural Designer I	4,800.	to	6,000.	per year*
Architectural Designer II	4,200.	to	5,250.	per year*

*—First figure indicates tentative starting salary—5% increase annually for 5 years.

Apply immediately, giving education, experience, professional registration, references, etc.

Department of Public Improvements
200 West Franklin Street
Baltimore 1, Maryland

WANTED

For Large Costruction Project

Northern Chile, 9200', Equable Climate
Eighteen Months Contract—Proven Experience
Ability to Speak Spanish Desirable

UTILITY SUPERINTENDENTS (PIPELINES, CARPENTRY, CONCRETE, ETC.)
COST & FIELD ENGINEERS
DIESEL MECHANIC SPECIALISTS
ELECTRICIANS (HY. EQUIPMENT & GEN. CONST. OPERATIONS)
ACCOUNTANTS
STENOGRAPHERS — MALE BILINGUAL
EARTH & ROCK SUPERINTENDENTS
SAFETY ENGINEERS
WAREHOUSE SUPERINTENDENTS
MECHANICAL SUPERINTENDENTS
PLUMBING SUPERINTENDENTS
OPERATORS

P-8892, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

MAN WANTED

SALES ENGINEER

For selling and promoting asphalt construction and materials. Permanent position and excellent opportunity for right man. State qualifications and references.

SW-8369, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

PLASTEEL

Protected Steel

ROOFING AND SIDING

for Industrial Buildings

Some territories available for Representation

Prefer men with Engineering background familiar with industrial building construction. *Write*

PLASTEEL PRODUCTS CO.

Washington, Pa.

(See our advertisement in display section of this paper)

PIPING SUPERINTENDENT

Construction firm has opening in California for an experienced Piping Supt. Minimum 5 years experience on lump sum contracts. Furnish experience record and photo.

P-8978, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

WANTED

Old and well established general contracting firm wishes to employ a responsible man capable of doing estimating, some architectural drafting and supervision of men. Man must be capable of handling job from start to finish.

Compensation—Substantial salary plus bonus or salary and profit sharing basis. Right party can write his own ticket.

In reply send full details in first letter stating salary desired, age, references of past employers and whether or not interested in becoming a permanent resident of the state of Florida.

Direct reply to **P. O. Box 240**
Bradenton, Florida

WANTED

CONSTRUCTION SUPERINTENDENT

WITH REFINERY AND HEAVY CONSTRUCTION EXPERIENCE. LOCATION SOUTH NEW JERSEY AND EASTERN PENNSYLVANIA. STATE AGE, EXPERIENCE AND FULL PARTICULARS.

P-8582, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

GRADUATE CIVIL ENGINEER

with broad experience, a substantial portion of which has been in hydraulics. An excellent opportunity with a large public utility located in eastern Pennsylvania. Apply by letter stating education, experience and salary requirements. Address

P-8786, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

EXPERIENCED ESTIMATOR

Wanted by established Phila. concern for Sewers, Highways, Bridges, Treatment Plants. State Salary, experience, and when available.

P-8955, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

POSITION VACANT

(Continued from page 157)

WANTED: SUPERINTENDENT for heating, piping and air conditioning contractor located in Central Pennsylvania. Experience necessary. Salary plus commission. Send references and state age and experience in first letter. P-8946, Engineering News-Record.

POSITIONS WANTED

STRUCTURAL DESIGN Engineer. Graduate C.E., Age 45, 23 years experience designing steel, concrete and timber structures, together with any type of foundation. Thoroughly competent to execute complete structural designs on any type building or waterfront structure, and supervise the execution of working drawings. Correspondence invited for position of responsibility. PW-7208, Engineering News-Record.

PROJECT MANAGER: General or Job Superintendent; 30 years experience; heavy and light construction; housing; apartments; schools; hospitals; office buildings; chemical; industrial plants; powerhouses; handle all trades including mechanical and allied work. PW-8779, Engineering News-Record.

SUPERINTENDENT, 36, experience includes commercial, industrial, housing, federal, also estimating and purchasing. Excellent references. Available May 15. PW-8807, Engineering News-Record.

SUPT. ASPHALT Paving work General construction 25 years experience operate any type mix estimate cost and do work economically. Chemical Engineer. Speak Spanish. PW-8859, Engineering News-Record.

AMBITIOUS CHIEF Accountant experienced in corporate setups, finances and joint venture projects desires position with reputable engineering or construction firm. Twenty-five years experience large and small projects all types construction. Now employed but desire change. A-1 references and bond, latest cost methods used. PW-8888, Engineering News-Record.

CIVIL ENGINEER, age 39—15 years experience in the field and office on location and topographic surveys, highways, pipelines, heavy construction. Desire foreign position. PW-8904, Engineering News-Record.

STRUCTURAL ENGINEER, Cornell graduate, licensed, 25 years varied experience in design and construction of subways, buildings, foundations, docks, statically inderterminate analysis, etc. PW-8907, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT, highway railroad, general plants, stone quarries, general excavation, supervision of heavy machinery on traffic. PW-8912, Engineering News-Record.

(Continued on page 159)

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PW-8909, Engineering News Record
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POSITIONS WANTED

(Continued from page 158)

CONSTRUCTION SUPERINTENDENT — 27 years experience in complete charge of projects consisting of: chemical plants; slip-form concrete structures; material handling and process equipment installations; grain elevators and dryers; cement plants. Under fifty years of age. Will go any location. Further details on interview. PW-8914, Engineering News-Record.

MEC. ENG.—B.S., Licensed, 26, single, 5 years broad design experience heating, plumbing, ventilation and power plant installations. Desire foreign position. Will start at bottom. PW-8925, Engineering News-Record.

CONTRACTOR'S RIGHT Hand Man: age 36, experienced Manager-Estimator-Purchasing Agent—On: Commercial, Multi Residential, Industrial Bldg. Construction—including all utilities;—and engineered construction covering, airports, marine facilities, railroads, roads, and quarry operation. Desires permanent position as Manager, Estimator, or Purchasing Agent for Gen. Contractor; or as Area Sales Manager fer Cement co., bldg. supply co., or w/equipment mfg. or dealer. Good references. In reply state exact salary connected with position open. PW-8941, Engineering News-Record.

SUPERINTENDENT CONSTRUCTION, 25 years institutional, industrial or commercial projects. Anywhere. Engineer. Salary $150.00. PW-8963, Engineering News-Record.

CONSTRUCTION ENGINEER: Graduate. Age 39; 17 years experience heavy construction; concrete, steel, excavation, marine construction. 12 years as Project Engineer and Construction Manager. Available immediately. Salary open. PW-8977, Engineering News-Record.

FIELD ENGINEER—One years experience doing layout work, and estimating. Recent graduate. Married. Available for employment any place east of the Mississippi, where I can maintain my marital obligations, available July 11, 1949. PW-9025, Engineering News-Record.

CONSTRUCTION EXECUTIVE: Thirty years of experience, twelve of which was self-employed in New York. References relating to capability, integrity and resourcefulness obtainable. Wishes a position with construction firm in or around the city of New York, preferably in the city. PW-8972, Engineering News-Record.

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Patent Practice

before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 454, 815-15th Street, N.W., Washington 5, D.C.

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Bucyrus-Erie 30B tunnel front 9' stick 1½-yd dipper LBS#3392.
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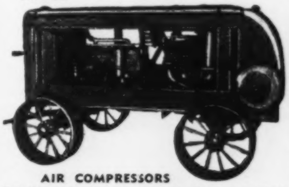

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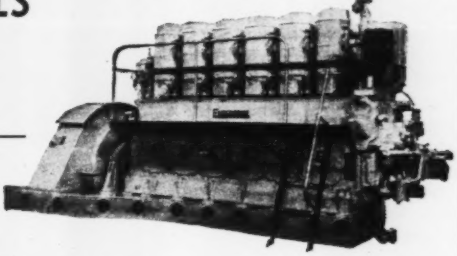

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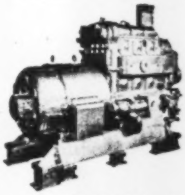

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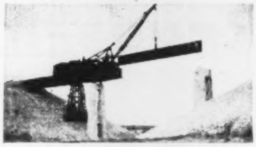

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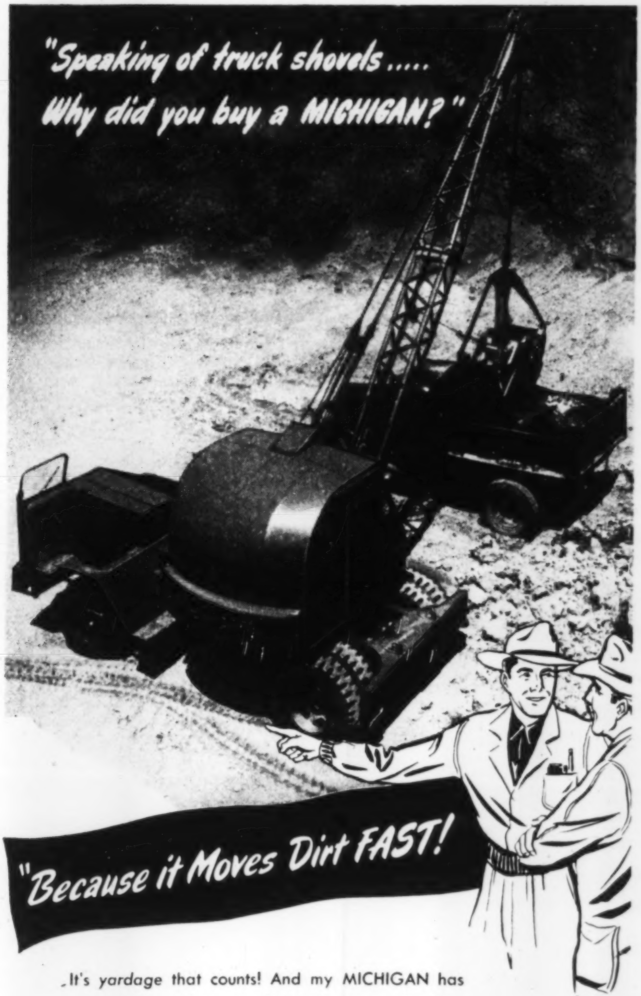
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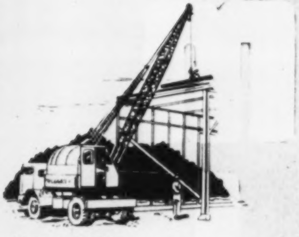
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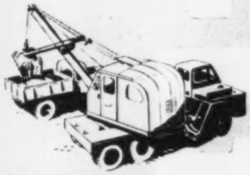
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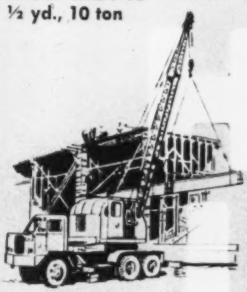
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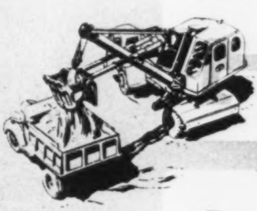
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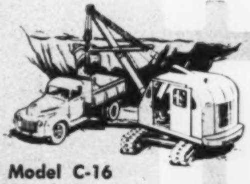
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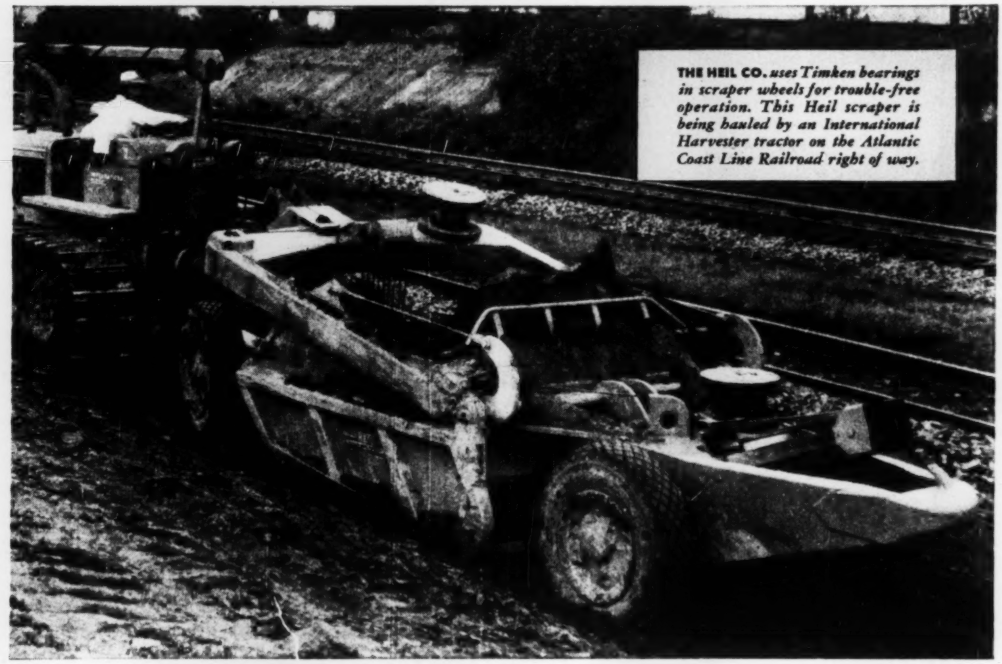

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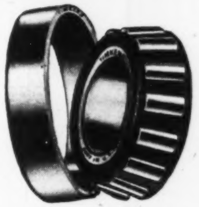

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